

Forest Management Agreements

**Five-Year Review
1985-1990**



Ontario

**Ministry of
Natural
Resources**

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ERRATA: 1990 FMA FIVE-YEAR REVIEWS

CORRECTION TO PAGE 110

Table 2

Working Group - Jack Pine; Declared Surplus should read -1,365*, was -1.365*

CORRECTION TO PAGE 148

Table 2

Total Actual Harvest should read 43,907, was 44,907

CORRECTION TO PAGE 173

Table 2

Total MAD 1990-1995 should read 30,746, was 30,756

CORRECTION TO PAGE 203

Table 4

Species - Conifer; Actual m³ should read 1,219,535, was 1,291,535

CORRECTION TO PAGE 203

Table 5

Species - Conifer; 1985-1990 Actual should read 133.7, was 113.7

FOREWORD

BACKGROUND

Forest Management Agreements (FMAs) came into being in Ontario through an amendment to the Crown Timber Act in 1979. The Act, as amended, provided that the Minister of Natural Resources, subject to the approval of the Lieutenant-Governor-in-Council, could enter into Forest Management Agreements with private sector companies.

The first FMAs were signed in 1980 and the most recent in 1987. As of January 1990, there were 28 FMAs in the province, covering a total of 180,962 square kilometres. This represents 70% of the 257,244 square kilometres of licensed forest in the province.

The FMAs, which cover a specific area of Crown land, replace existing licensing arrangements with an agreement that requires the company to manage the forests in the FMA area on a sustained yield basis. In addition to harvesting, the FMA holder is responsible for all the regeneration and other silvicultural activities necessary for proper forest management, including the construction of access roads. As well, the FMA holder is responsible for addressing environmental concerns and those of other forest users.

The Ministry of Natural Resources provides certain funding for the FMA, and must approve management documents submitted by the companies. The Agreements are for twenty years, but Section 15 of the Agreement provides that every five years, the Minister must evaluate how the company has carried out its obligations under the Agreement. If satisfactory, the FMA is extended for another five years.

The obligations of the company in a Forest Management Agreement, in general terms, are:

- a) adherence to submission dates for Timber Management Plans, Annual Work Schedules, and Annual Reports.
- b) adherence to the maintenance of harvesting operations at a level between 90% and 110% of the maximum allowable depletion (annual allowable cut) and any liabilities or damages following the fifth year.
- c) adherence to meeting the obligations for treatment of Not Satisfactorily Regenerated (NSR) lands.
- d) compliance with the "ground rules" which describe the procedures associated with:
 - i) the silvicultural treatments,
 - ii) road construction
 - iii) accommodating other forest users.

THE FIVE-YEAR REVIEW PROCESS

As per Section 15 of the Agreements, the Minister must conduct a review of the company's performance of its obligation every five years. A committee of three individuals is formed to conduct this review. In 1985 when the first FMAs were reviewed, the committee was comprised of Ministry staff from outside the region where the review was taking place. In an effort to conduct the reviews in the most objective way possible, the review committees of recent years have been comprised of independent auditors.

The five-year review of a Forest Management Agreement follows a process very similar to that of a financial audit. During the process:

- the review committee is supplied with information and documentation for the Agreement company and is provided access to all company records including;
 - the approved operating plan for the period under review,
 - the Annual Work Schedules for each year of the period under review,
 - the Annual Reports,
 - the five-year summary tables from the Timber Management Plan
 - and other documents outlining FMA activities ie. depletion, renewal and maintenance records.
- the review committee is able to examine the documentation prior to their field visit.
- the "physical" review lasts one week, which includes two days of field inspection, two days of examining company records (usually in the head office of woodlands office), and one day interviewing senior company personnel.

In addition, the committee has the opportunity to meet with Ministry staff and discuss with them their concerns or problems areas associated with the administration of the agreement.

The committee's task is to analyze the information provided and make recommendations based on their findings. The Terms of Reference for the review are outlined in Appendices A and B.

THE 1990 FIVE-YEAR REVIEWS

In 1990, nine FMAs underwent a five-year review by a group of consultants retained by the Ministry of Natural Resources. This report discussed the findings and recommendations made as a result of their review.

Five of the nine FMAs reviewed completed their tenth year in 1990. Therefore, this was their second five-year review. The five FMAs are:

- Iroquois Falls Forest, FMA No. 500200, Abitibi-Price Inc.
- English River Forest, FMA No. 500300, Canadian Pacific Forest Products Ltd.
- Upper Spanish Forest, FMA No. 500400, E. B. Eddy Forest Products Ltd.
- Lower Spanish Forest, FMA No. 500500, E.B. Eddy Forest Products Ltd.
- Gordon Cosens Forest, FMA No. 500600, Spruce Falls Power and Paper Company Ltd.

For the above FMAs, a review co-ordinator was hired to co-ordinate two review committees. The committees are all non-Ministry staff and are individuals from disciplines in biology and forestry and/or with senior industry/government background.

The remaining four FMAs have been in existence for only five years, therefore, this was their first five-year review. These FMAs are:

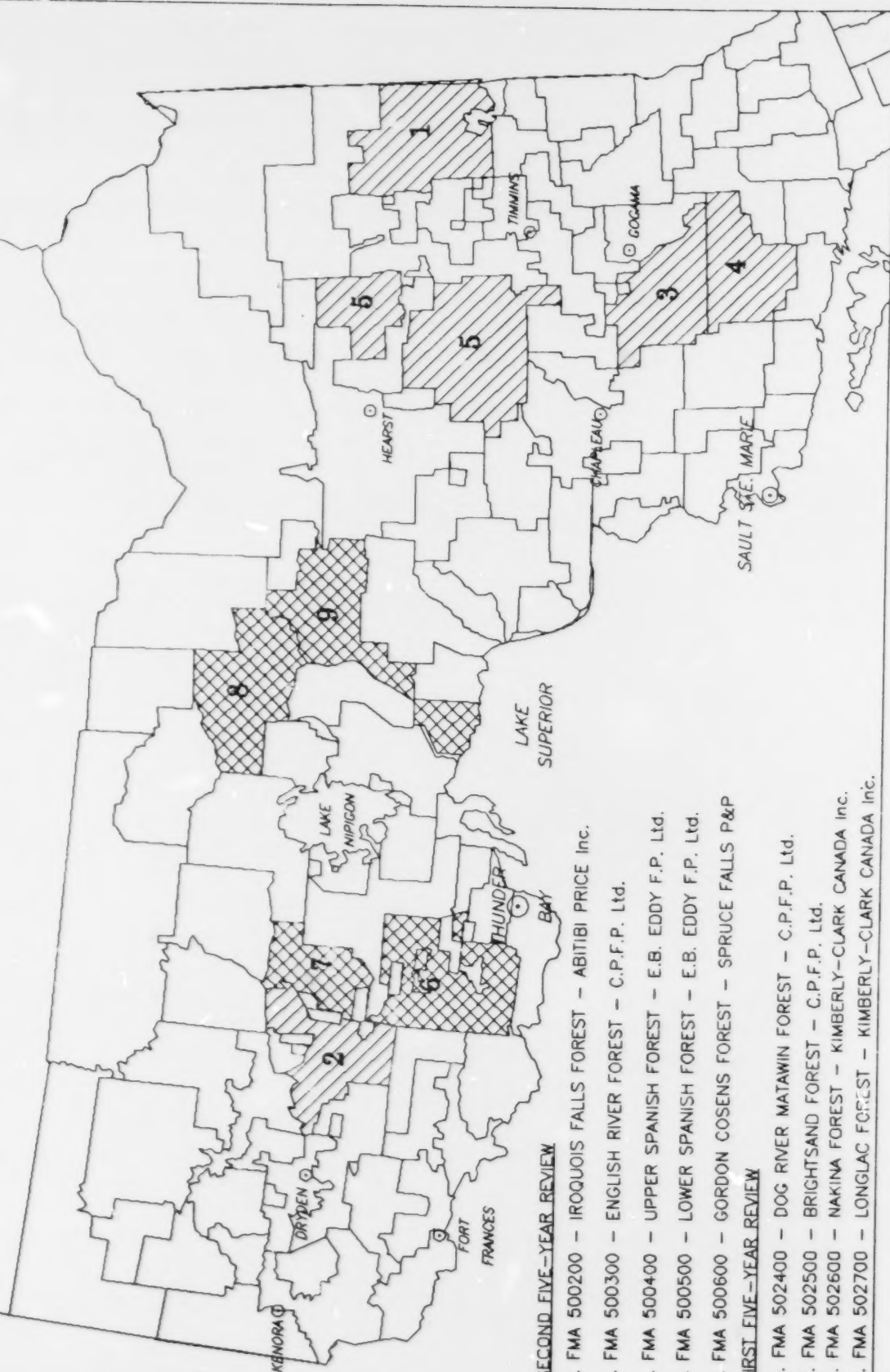
- Dog River/Matawin Forest, FMA No. 502400, Canadian Pacific Forest Products Ltd.,
- Brightsand Forest, FMA No. 502500, Canadian Pacific Forest Products Ltd.,
- Nakina Forest, FMA No. 502600, Kimberly-Clark Canada Inc.
- Longlac Forest, FMA No. 502700, Kimberly-Clark Canada Inc.

These review were conducted by two review committees, supervised by a Ministry official. The committee members are non-Ministry staff and are also individuals from disciplines in biology and forestry and/or with senior industry/government background.

The map on the following page shows the location of the nine FMAs reviewed in 1990.

This report discusses the findings and recommendations made as a result of the review for each FMA individually. As well, the general findings for the second five-year reviews and first five-year reviews have been summarized in the introduction to those sections.

FOREST MANAGEMENT AGREEMENTS 1990 FIVE YEAR REVIEW



SECOND FIVE-YEAR REVIEW

1. FMA 500200 - IROQUOIS FALLS FOREST - ABITIBI PRICE INC.
2. FMA 500300 - ENGLISH RIVER FOREST - C.P.F.P. Ltd.
3. FMA 500400 - UPPER SPANISH FOREST - E.B. EDDY F.P. Ltd.
4. FMA 500500 - LOWER SPANISH FOREST - E.B. EDDY F.P. Ltd.
5. FMA 500600 - GORDON COSENS FOREST - SPRUCE FALLS P&P

FIRST FIVE-YEAR REVIEW

6. FMA 502400 - DOG RIVER MATAWIN FOREST - C.P.F.P. Ltd.
7. FMA 502500 - BRIGHTSAND FOREST - C.P.F.P. Ltd.
8. FMA 502600 - NAKINA FOREST - KIMBERLY-CLARK CANADA INC.
9. FMA 502700 - LONGLAC FOREST - KIMBERLY-CLARK CANADA INC.

**FOREST MANAGEMENT
AGREEMENTS**

**SECOND FIVE-YEAR
REVIEWS**

1985-1990



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INTRODUCTION

In 1985, the Minister released the first five-year reviews of the first five FMAs in the province as required by legislation. The Agreement holders of these five FMA areas met all of the required obligations. All five FMAs were extended for a further five-year period.

The first five FMAs are:

1. Abitibi-Price Inc., Iroquois Falls Forest
- FMA 500200
2. Canadian Pacific Forest Products Ltd., English River Forest
- FMA 500300
3. E.B. Eddy Forest Products Ltd., Upper Spanish Forest
- FMA 500400
4. E.B. Eddy Forest Products Ltd., Lower Spanish Forest
- FMA 500500
5. Spruce Falls Power & Paper Company Ltd., Gordon Cosens Forest
- FMA 500600

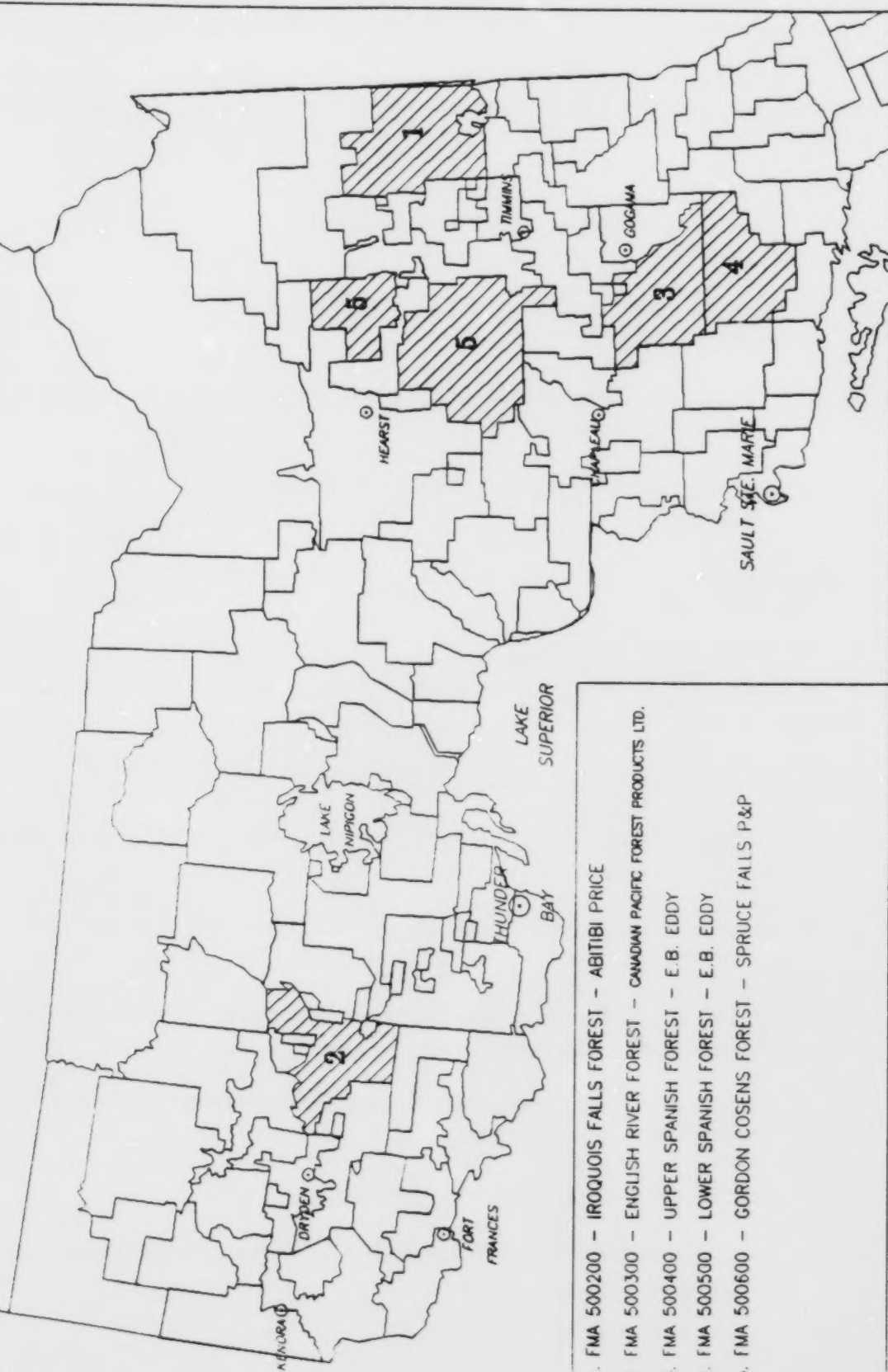
These five FMAs are ten years old and a second five-year review was conducted in June 1990. The second five-year reviews are the subject of this report. The map on the following page shows the location of the five FMAs.

The objectives of the review, as outlined in Appendix "A", included;

- to undertake a fair and objective review of the performance of the Agreement holder vis-a-vis the obligations under the Agreement.
- to examine Company records with regard to their adequacy and their conformity with the Ministry's records.
- to examine the relationships between the predicted and the actual volume/area yields in the timber management plan.
- to examine and report on the relationship between planned and actual wood harvested for the five-year period.
- to select and field inspect silvicultural projects.
- to examine and report on the effectiveness of the MNR supported road construction.

FOREST MANAGEMENT AGREEMENTS

1990 FIVE YEAR REVIEW



1. FMA 500200 - IROQUOIS FALLS FOREST - ABITIBI PRICE
2. FMA 500300 - ENGLISH RIVER FOREST - CANADIAN PACIFIC FOREST PRODUCTS LTD.
3. FMA 500400 - UPPER SPANISH FOREST - E.B. EDDY
4. FMA 500500 - LOWER SPANISH FOREST - E.B. EDDY
5. FMA 500600 - GORDON COSENS FOREST - SPRUCE FALLS P&P

- to determine the degree to which other forest users and other forest values have been accommodated in management planning and operations.
- to make recommendations on the extension of the Agreement's term.

In addition the review team was to:

- examine and report on Company forest management activities conducted beyond the obligations under the Agreement,
- examine and report on examples of innovative forestry practices and beneficial forest stewardship,
- examine and report where the Company has taken a positive approach beyond the planning process to address public concerns,
- examine and report on Company participation in the field of research and tree improvement, and,
- examine and report if the wood supply strategies are sufficient to meet long term (20 years) projected harvest levels.

The second five-year review was more intensive than the first five-year review in that the second review included;

- a review of the recommendations of the first five-year review and a status report on their implementation.
- a review of fifth-year stocking assessments.
- an examination of Free-to-Grow (FTG) assessments.

THE REVIEW COMMITTEE

In this second five-year review, the Ministry, in a step to further remove its involvement in the review process, hired a Review Co-ordinator to co-ordinate two committees or teams of three individuals per team. The team members are all non-Ministry staff and are individuals with backgrounds in biology, forestry, and senior industry/government. The Co-ordinator is a financial analyst with a discipline in reviewing public reports.

In total, the members of the two review committees possess over 170 years of forestry/biological experience. Five of the seven individuals, including the Co-ordinator, are professional foresters.

Similar to a financial audit, the second five-year review process was a review of the Agreement holder's obligations, both contractual and non-contractual. The review was not a "re-working" of all of the information and documentation that had taken place over the period. The review committee members were all professionals who were able to analyse the enormous amount of information effectively and efficiently.

Each of the second five-year reviews in this document contains a "Review Committee Statement" in which the individual review teams "signed off" the review.

GENERAL OBSERVATIONS

Generally speaking, the Forest Management Agreement tenure system in Ontario is working.

All of the FMA Agreement holders whose operations were reviewed in the Second Five-Year Review, met all of their contractual obligations. In addition all of the Companies involved, some to a greater extent than others, demonstrated activities outside of the contractual obligations.

All of the NSR obligations were met.

The integration of silvicultural planning with that of harvesting has progressed well over the ten-year history of the five FMAs reviewed.

The "transfer" of responsibility for silviculture, tending, and planting activities from government to industry has been accomplished.

The "new" relationship between Ministry staff and Company staff is developing positively. Communication between field staffs has improved.

The review committees were able to fulfil all of their tasks as per the Terms of Reference except for the final task - **"to examine and report if the wood supply strategies are sufficient to meet long term (20 years) projected harvest levels"**. In each of the reviews the Company described their long term wood supply strategies, and in some cases presented their forest harvesting models to the committee. However, the committee had insufficient time to analyse in detail the workings of the model, or any of the assumptions concerning the forest base that were used in the model.

It was the review committees' recommendation to the Minister of Natural Resources that each one of the five FMAs reviewed be granted an extension to the FMA Agreement term.

SUMMARY OF FINDINGS

COMPANY CONCERNS

During the review process, the committees were able to identify some common concerns amongst the Agreement holders. Some of these include:

- As presently required it is virtually impossible for Companies to provide accurate forecasts of silviculture and road construction programs to be included in the Annual Work Schedule by the due date of November 30. The Companies suggest that the **harvest schedule** be presented on November 30 and the schedules for **roads** and **silviculture** be presented on January 1.
- The variation in interpretation and application of the various Resource Use guidelines.
- The uncertainty of adequate funding is a growing deterrent to the continuation of the excellent advances made in silviculture on the FMA Agreement areas.
- The Ministry should review the process and timing for obtaining FMA funding to improve the accuracy of the forecasts, to provide flexibility in distribution of funding between renewal treatments and to produce a firm allocation of funds by April 1 of the operating year.
- Industry perceives that the original level of government commitment toward the FMA program has faded.
- Ongoing personnel changes at field level in the Ministry is very disruptive.

The Companies believe there is an urgent need for a revised timber production policy formulated jointly by the forest industry and the Ministry.

RECOMMENDATIONS

There were three major problem areas, common to all four FMA holders, that the review committee encountered during the FMA reviews; third party operators, liquidated damages, and long term harvest strategy. Here are the committees' recommendations:

a) third party operators - the Ministry should require that in any third party agreement between a FMA holder and a third party operator, if the third party is responsible for over cutting or undercutting as defined in the Agreement, that such third party be liable for any remedial action or liquidated damages specified in the Agreement paragraph 20. The third party should have recourse, if applicable, to adjustments similar to that provided in paragraph 20(2), 20(6), 41(1) and 44(1,2) of the Agreement. The Companies should continue to advise the Ministry, as they have in the past five years, of any overcut or undercut on the Agreement areas that the Companies feel will persist

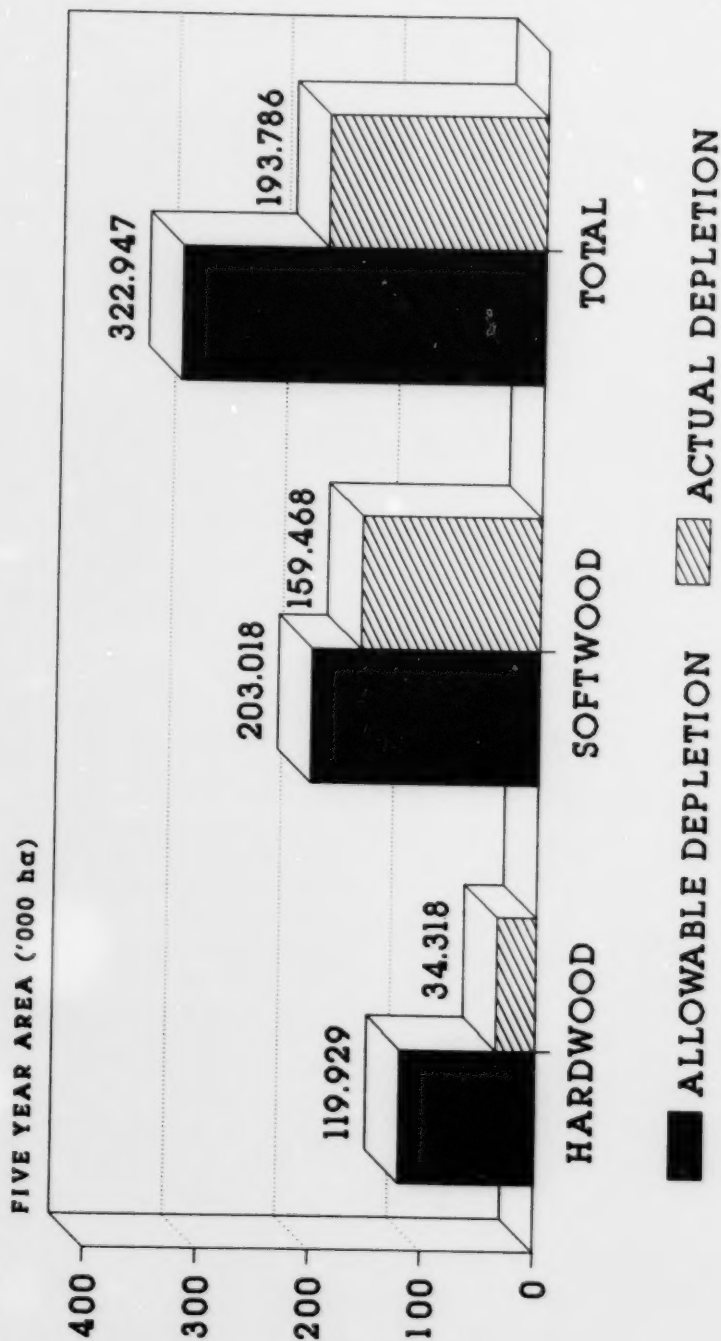
through the five-year period and where necessary seek the appropriate adjustments as provided for in paragraph 2 (2) of the Agreements.

b) liquidated damages - that following the submission of a Final Depletion Report for the 1985-90 period by the Company, on or before November 15, 1990, the Ministry shall complete Table C.2 - "Calculation of Area Subject to Damages". (Section 10.0 of the TMP Manual) for the Agreement area, and review the results with the Company.

c) long term harvest strategy - that the Ministry incorporate a review of each Forest Management Agreement holder's long term wood supply/harvest strategy during the preparation of the 1995 - 2000 Timber Management Plan.

The following two graphs show the comparison between allowable depletion area and the harvest versus regeneration area on the five FMAs combined for the period under review.

COMPARISON OF 1985-1990 ALLOWABLE VS. ACTUAL DEPLETION FMAs 500200,500300,500400,500500,500600

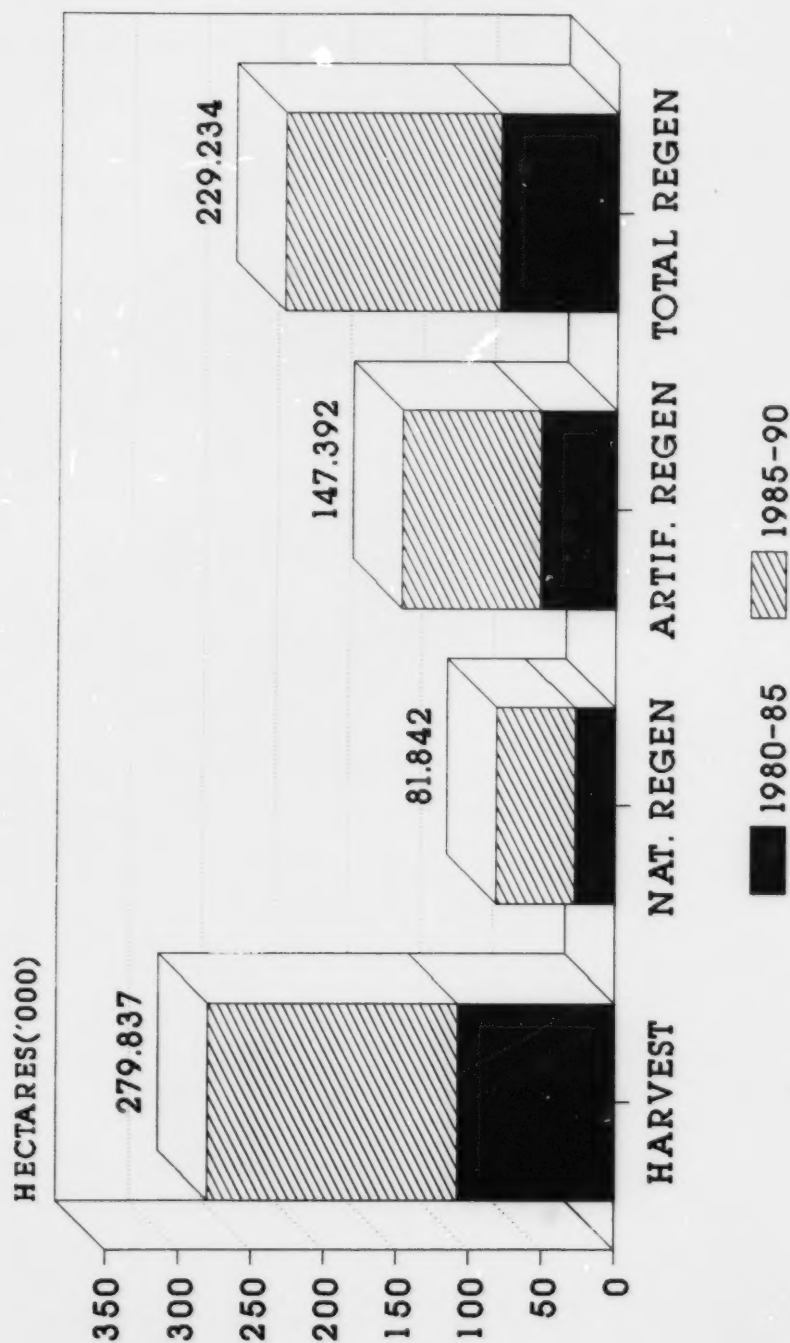


Note:
 Allow Depl=Plan Harvest & Surplus
 Act Depl=Act Harvest & Non-Harvest Depl

1980-1990

HARVEST AND REGENERATION

FMA's 500200,500300,500400,500500,500600



SECOND FIVE-YEAR REVIEW

ABITIBI-PRICE INC.

**IROQUOIS FALLS FOREST
FMA 500200**

1985-1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Ministry of Natural Resources (the "Ministry") and Abitibi-Price Inc. (the "Company") signed a Forest Management Agreement or FMA (the "Agreement") on April 28, 1980. This Agreement, number 500200, was designated the **IROQUOIS FALLS FOREST**. The purpose of this Agreement was to provide a continuous supply of forest products for the wood processing plants of the Company at Iroquois Falls and to ensure that the Iroquois Falls Forest is harvested and regenerated to produce successive crops of timber on a sustained yield basis.

A review of the first five consecutive years of the Agreement was conducted on the Iroquois Falls Forest in 1985. As a result of a favourable report of Company performance of its obligations under the Agreement, the Ministry and Abitibi-Price Inc. signed an extension to FMA 500200 on April 22, 1986 with the new Agreement having a term of twenty years commencing April 1, 1985.

The review of the second five-year period (1985-1990) of the Agreement was conducted on the Iroquois Falls Forest to determine whether the obligations of the Company under the Agreement have been satisfactorily performed and to recommend to the Ministry whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of four (the "Committee"), engaged by the Ministry for this purpose. The four Committee members were:

- Mr. John M. Duncanson, B.Sc.F., R.P.F.,
Duncanson Investment Research Inc.,
Review Co-ordinator
- Mr. Ed Markus, B.Sc.F., Former Director,
Timber Sales Branch, Ministry of Natural Resources,
Committee Chairman
- Ms. Kandyd Szuba, B.Sc.F., Ph.D.,
Private Consulting Biologist
- Mr. Herb Bax, B.Sc.F., R.P.F.,
Manager of KBM Forestry Consultants Inc.

1.3 TASKS OF THE REVIEW COMMITTEE

The Committee's assignment was to undertake a fair and objective review of Abitibi-Price Inc.'s performance on the Iroquois Falls Forest during the second five-year term in respect to its obligations under Forest Management Agreement 500200 and to make recommendations to the Ministry on the extension of the Agreement's term according to the "evergreen" section of the Agreement.

As well, the Committee was requested to make conclusions and recommendations on any significant matter concerning the administration of the Agreement by the Ministry or its implementation by the Company.

The review was conducted by:

- examining the management, operating, and annual plans, and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural, and access road records for adequacy and for conformity with the management plans and the ground rules of the Agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provisions of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects, and road construction typical of the techniques employed on the forest for conformity with the Agreement holder's records and for field application of the ground rules,
- determining the degree to which other forest users and other forest values are accommodated in the management planning and in field operations,
- meeting with Company and Ministry staff to identify problem areas and Agreement concerns on the part of either party, and,
- as specified in detail in Appendix A - "Terms of Reference for the Second Five-Year Review of a Forest Management Agreement."

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION AND SUBMISSION OF PLANS

The Agreement requires the Company to prepare management and operating plans, annual work schedules (AWS) as well as annual reports. These plans must be prepared and submitted to the Ministry according to the time frame specified in the Agreement and in accordance with the planning manuals approved by the Ministry for this purpose.

The 1985-90 Operating Plan for the Iroquois Falls Forest was submitted on September 28, 1984, prior to the due date. At this time, however, the ground rules for the Modified Management Areas (Areas of Concern) had not been agreed upon. Local Ministry staff were concerned that the operating plan would in all probability have to be altered when the ground rules were finally agreed upon by the Company and the Ministry. The plan was returned to the Company on October 30, 1984 and discussions began between the Company and the Ministry to reach agreement on the ground rules.

The operating plan was re-submitted on January 31, 1985. On March 29, 1985, the Ministry wrote to the Company with comments and a request to change the plan. On June 12, 1985 the Company re-submitted the plan again. The Ministry expressed further concerns to the Company and another meeting with the Company was held on July 16, 1985. The Company submitted the revised Operating Plan on September 19, 1985. The plan was approved October 22, 1985. According to the Agreement the Ministry and the Company have three months and two weeks to finalize plan changes. In this case the process took in excess of nine months past the final date stipulated in the Agreement.

The delay in final approval of the five-year operating plan led to a five month delay in approving the 1985/86 Annual Work Schedule, past the stipulated final approval date.

The 1988/89 Annual Work Schedule was approved two months past final approval date because of a delay in Ministry approval of a large bridge crossing.

Approval of the 1989/90 Annual Work Schedule was late due to the processing of a minor amendment. All of the above annual work schedules were submitted by the Company on or before the due date.

The nine month delay in final approval of the 1985-90 Operating Plan was in large part due to planning procedures in place at that time as well as working with new and unfamiliar guidelines for the protection of other forest values. On January 1, 1986 the Ministry published a new planning manual, Timber Management Planning Manual for Crown Lands in Ontario, which replaced the planning manual in use for the preparation of management, operating, and annual plans and annual reports for Forest Management Agreement areas. The new planning manual provides a clearer, more structured process to be followed by the Ministry and the Company.

The Committee believes that the new guidelines for non-timber values and the excellent co-operation that exists between Company and the Ministry will minimize delays in future.

The 1990-1995 Timber Management Plan was prepared and submitted in accordance with the new TMP manual and was subsequently approved within the time frame specified in the Agreement.

2.1.2 PLAN IMPLEMENTATION

The Agreement requires that the Company conduct its operations in accordance with the approved management, operating and annual plans.

Silvicultural operations and road construction performed by the Company are summarized in Table 1. The Committee randomly examined areas allocated for harvest and road locations specified for construction in the management documents and found the Company records to show these activities were undertaken as planned. An exception was a 73% undercut of the planned poplar harvest. Various areas assessed during the field trips confirmed adherence to the plans. Explanations for the actual levels versus planned levels for harvest are given in Section 2.3.

The levels of harvesting and regeneration were 87% and 92% respectively of the approved five-year plan. Site preparation and tending significantly exceeded the planned levels (140% and 150% respectively, refer to Figure 1).

The regeneration program was proportionately in line with the available harvest area although planting exceeded the planned level (119%) and natural regeneration methods were lower than planned (69%). The Company received more trees than planned within the five-year period to regenerate areas licenced by third parties. This accounted for the over-run in planting. Site preparation levels were exceeded in order to accommodate the additional trees received. The higher site preparation level also reflected the additional areas site prepared simultaneously with harvesting activities under the Area Method Regeneration System.

Explanations for the higher level of tending are given in Section 2.4.

2.2 THE GROUND RULES

2.2.1 KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

Based on discussions held with the Company, both in the office and in the field, it was apparent that Company personnel had a thorough understanding of the provisions of the ground rules and the Agreement.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

Discussions with Company personnel revealed a thorough understanding of site and species requirements as they carried out forest operations in relation to the ground rules and the Agreement. Four basic methods of treatment were used to successfully meet all the regeneration standards and requirements; shear blade and plant, area method regeneration, aerial seeding, and natural regeneration.

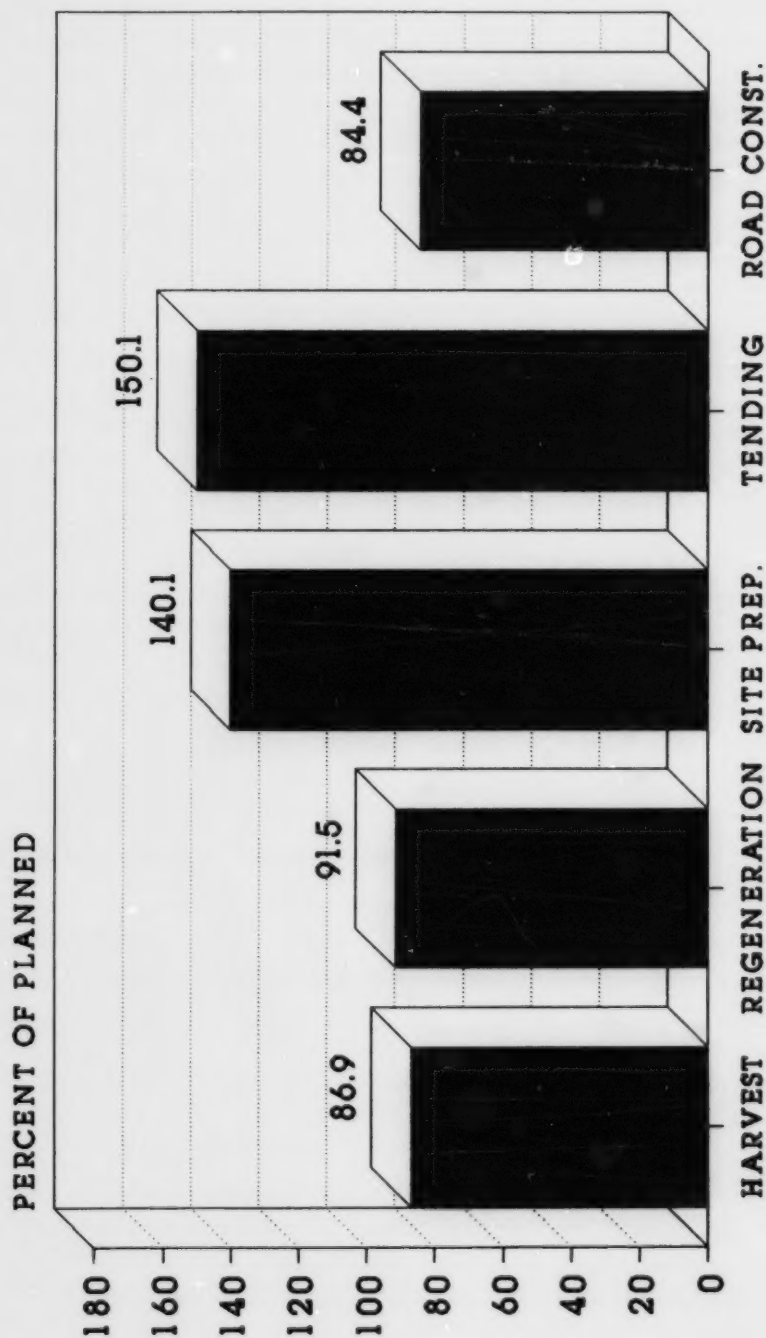
Table 1

Summary of Company Forest Operations with Ministry Funding

FMA Expenditure and
Accomplishment Report
For The Five-Year Period
1985 - 1990FMA 500200
Iroquois Falls Forest
Abitibi-Price Inc.

Activity		AREA (hectares)	COST (dollars)
Harvest		27,340	
Natural Regeneration		11,377	
Artificial Regeneration	- Planting	13,898	
	- Blended	2,900	
Total Regeneration		28,175	\$ 6,126,948
Retreatment		0	
Site Preparation	- Mechanical	12,815	
	- Chemical	8	
	- Prescribed Burning	0	
Total Site Preparation		12,823	\$ 4,230,046
Tending	- Chemical Cleaning	32,055	
	- Manual Cleaning	0	
	- Thinning	0	
Total Tending		32,055	\$ 3,011,947
TOTAL SILVICULTURAL PAYMENTS			\$ 13,368,941
		(kilometres)	
Road Construction	- Primary	39.2	
	- Secondary	146.3	
Total Road Construction		184.8	\$ 1,461,800
Road Maintenance		1,177.0	\$ 435,300
TOTAL ROAD PAYMENTS			\$ 1,897,100
TOTAL PAYMENTS			\$15,266,041

**FIGURE 1: COMPARISON OF 1985-1990
OPERATING PLAN VS. ACTUAL**
FMA 500200 IROQUOIS FALLS FOREST



Source: Annual Reports,
1985-90 Operating Plan.

Fifth year stocking assessments of treated areas are carried out on an annual basis by the Company. No areas were assessed as failures requiring retreatment (Table 1). Two areas in third party operating areas received renewal treatments at no cost to the Ministry; 73 hectares of site preparation and 15 hectares of planting were carried out. The Company and Ministry are to be commended for successful establishment and maintenance of over 25,000 hectares of black spruce plantations in the past ten years. The challenge to maintain these plantations against insect and disease will require continual monitoring and staff training.

Currently, about 30% of the regeneration of cut-overs takes place through the protection of advanced regeneration in the harvesting process, thereby decreasing the cost of reforestation and increasing the rate of renewal. This level is expected to increase in the future. The Company is to be commended for their initiation and development of low cost regeneration methods (aerial seeding, natural regeneration and area method regeneration) in part through the use of modified, low ground-pressure bearing, wood forwarders.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

Sampling of project records and invoices in the office and the field indicated that procedures as set out in the ground rules were followed correctly.

2.2.4 PREPARATION OF NEW GROUND RULES

The new ground rules for the next five-year plan have been agreed to by both parties and incorporate the silvicultural methods and techniques developed over the past five years. Some of these include direct contracted nursery stock purchases by the Company, area method regeneration planting of black spruce containers, aerial seeding, and the erection of silvicultural signs for public information.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS, AND WOOD FLOW

According to paragraph 20(1) of the Agreement the Company has agreed to maintain its harvest on the Iroquois Falls Forest at a level between 90% and 110% of the calculated allowable depletion (allowable cut) for each working group. Using paragraph 10(2) of the Agreement, the Company may request the Ministry to authorize variations in the levels specified.

Paragraphs 20(3) and 20(4) of the Agreement provide for a rectification by the Agreement holder of any overcut or liquidated damages in the event of an undercut on the Agreement area in a specified five-year period. The Agreement holder may avoid liquidated damages through the declaration of timber surplus (paragraph 20(5)) to its needs in an approved Management Plan.

Table 2 and Figure 2 show a comparison of allowable and planned depletion to actual depletions by area (ha).

TABLE 2

Depletion of Agreement Area for 1985 - 1990
(hectares)

FMA 500200
Iroquois Falls Forest
Abitibi-Price Inc.

Working Group	Maximum Allowable Depletion	Declared Surplus	Planned Harvest	Actual Harvest	Actual Depletion	Difference Plan - Act Harvest
Spruce	36,875	16,445	19,377	21,007	22,693	-1,630
Fir	2,205	-806*	2,800	3,140	3,277	-340
Jack Pine	2,815	1,800	983	665	934	+318
Birch	3,415	2,895	460	461	675	-1
Poplar	8,415	0	7,745	2,067	2,288	+5,678
TOTAL	53,725	20,334	31,365	27,340	29,867	+4,025

* Approved liquidation cut in amended Operating Plan

- (1) Planned Harvest = Planned Depletion - Planned Reserves
- (2) Actual Harvest = Actual Cut + Bypass
- (3) Actual Depletion = Actual Harvest + Reserves + Non-Harvest Depletion

Note: Figures represent 4 years actual data and final year estimated data

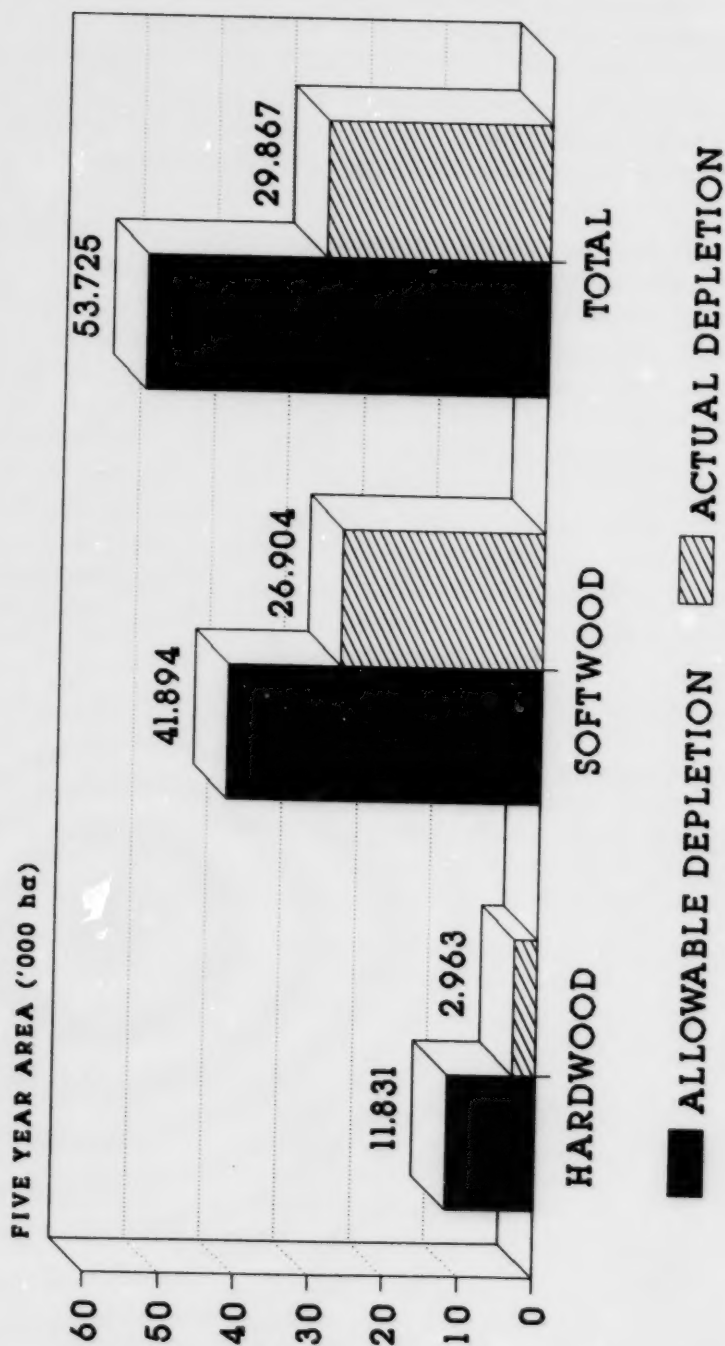
Source: Table 4.1 Report of Depletion by Area 1985 - 90

Early in the second five-year period of the Agreement, the Company was requested by the Ministry to increase the utilization of poplar from the Agreement area. After discussion with local users of poplar and reviewing the marketing opportunities for this species the Company arranged with a third party operator to begin utilizing more poplar. However, when this operator planned to market the poplar in the Province of Quebec, the Ministry denied permission to do so.

In 1987, because of a planned major expansion of a local plant, the Company was directed to make available an additional 100,000 cubic metres of poplar annually. The Company initiated arrangements to provide this additional poplar as well as previous commitments through a third party operator. A major amendment to the Operating Plan was made to accommodate this planned increase for poplar harvesting. The amended plan was approved by the Ministry in 1987. However, the increased demand for poplar did not occur on schedule due to unexpected delays in bringing the expanded plant into production. In addition, the inability of the third party operator and the plant owner to finalize a contract for the cutting and payment of poplar reduced the poplar harvesting on the Agreement area. Finally, a fire in the plant further reduced the demand for poplar. All of these circumstances resulted in the significantly lower cut of poplar on the Agreement area for the five-year period.

It is the opinion of the Committee that the undercut of the poplar working group over the past five years was caused by circumstances beyond the control of the Company.

**FIGURE 2: COMPARISON OF 1985-1990
ALLOWABLE VS. ACTUAL DEPLETION
FMA 500200 IROQUOIS FALLS FOREST**



Note:
 Allow Depl=Plan Harvest & Surplus
 Act Depl=Act Harvest & Non-Harvest Depl

RECOMMENDATION : The Ministry should require that in a third party agreement and/or third party licence between a FMA holder and a third party operator, the third party is responsible for overcutting or undercutting as defined in the Agreement, and that such third party be liable for any remedial action or liquidated damages specified in the Agreement, paragraph 44 (1,2). The third party should have recourse, if applicable, to adjustments similar to those provided for in paragraph 20(2), 20(6), and 40(1) of the Agreement.

The Company should continue to advise the Ministry of any over cut or under cut on the Agreement area that it feels will persist through the five-year period and where necessary seek the appropriate adjustments as provided for in paragraph 20(2) of the Agreement.

RECOMMENDATION: That the Company provide accurate data for estimated and actual yields on a more detailed basis for Timber Management Planning purposes.

A comparison of Company estimated yields to actual yields could only be done on a "rough estimate" basis, and in fact could only be done at a working group level for the total Agreement area for the five-year period under review. These comparisons indicated that actual yields differed from estimated yields by -21% for the spruce working group, +70% for the balsam fir working group, and -35% for the jack pine working group. The Company believes these discrepancies are largely due to the great variability of yields in the over-mature stands that predominate the area being harvested.

The Company's wood sourcing strategies for its paper mill at Iroquois Falls show a sensible approach to the woodshed surrounding the mill and to other mills in the area. The Company's paper mill at Iroquois Falls utilized an average of 775,000 cubic metres of wood annually over the past five years.

The major sources were:

- roundwood from the Agreement area	38%
- purchased roundwood from the Crown and other sources	27%
- purchased wood chips from local sawmills	35%

The Company is commended for the arrangements in which it participates with the Ministry to provide wood suitable for lumber production to local sawmills in exchange for chips for use at the paper mill. The Company is also providing poplar, surplus to its requirements, from the Agreement area for use by veneer plants and waferboard plants. The Company and the Ministry should continue to strive for the maintenance and enhancement of best end-use forest management, and the diversification of the local forest industries.

2.4 NSR OBLIGATIONS

The Company exceeded all the Not Satisfactorily Regenerated (NSR) land treatment obligations during the 1985-90 period. In particular, 18,000 hectares were tended versus an original estimate of 1,500 hectares. The Company undertook, on their own initiative, subsequent surveys that revealed older cut-overs regenerating better than expected. The Company incorporated the use of the herbicide "Vision" into a cost-effective, plantation enhancing, tending method on sites in the Iroquois Falls Forest.

NSR treated areas were sampled for accuracy in the office and the field. No discrepancies were found. It was noted that the Company has done excellent work in regenerating many of the NSR 2 and 3 sites back to a productive forest status.

The revised 1989 Forest Resource Inventory (FRI) indicates 749,010 hectares of productive forest land which includes 131,050 hectares (17%) classified as barren and scattered (B&S) or NSR 2-6. A minimum 50,000 hectares of the B&S/NSR classified production forest land was stocked to black spruce at the time of the inventory. The Company had submitted the stocking data, including planting and tending information, however the data was not received in time to be included in the FRI. The Committee is concerned that the B&S classification of the FRI does not accurately reflect the status of the productive forest land base.

RECOMMENDATION: That the Ministry ensure the FRI be revised and updated incorporating the Company data to accurately reflect the productive forest land base.

2.5 ROAD CONSTRUCTION AND MAINTENANCE

Paragraph 31 of the Agreement provides for the Ministry to pay (subject to a maximum amount per kilometre) for the construction or the reconstruction of forest access roads on the Agreement area. To be eligible for payment, roads must be detailed in approved operating and annual plans and constructed according to the standards specified in schedule "F" of the Agreement.

During 1985-90, the road network on the Iroquois Falls Forest was significantly expanded through construction and upgrading; 185 km of mainly secondary roads (79%) were added. These roads provided the Company with access to spruce stands in the north-central and west-central portions of the Agreement area. New and upgraded roads in the southern part of the Agreement area facilitated harvesting of poplar and spruce by third party operators. Approximately 75% of the area of spruce harvested during 1985-90 was mature or over-mature, indicating that road funding was used to access old stands of timber. During the life of the FMA (1980-90), road funding provided for a total of 313 km of new or reconstructed roads. Extensions of these roads in 1990-95 will provide access to large tracts of mature timber remaining in the extreme north-western and north-eastern segments of the Agreement area.

Road location on the Iroquois Falls Forest is relatively easy because of the typically flat terrain. Planned and actual road locations corresponded closely. The Committee checked all roads built during 1985-90 by superimposing maps derived from recent aerial photographs onto maps that

accompanied the original Annual Work Schedules (Annual Plans); locations rarely deviated by as much as 200 metres.

On the Iroquois Falls Forest, all roads are built by the Company or by third party operators in their respective harvest areas. Generally, gravel is scarce and there are extensive wet areas where brush mats are needed to stabilize the road base. This makes road construction expensive. FMA funding provides for only about 30% of the actual total cost of primary and secondary roads. The Company noted that the overall amount of FMA funding for construction has generally declined but funding for maintenance has remained adequate. Funded roads are graded when necessary and appeared to be well maintained.

Roads eligible for FMA funding are inspected jointly by a representative of the Company and the Ministry to verify standards and measure lengths, then an invoice is submitted to the Ministry for payment. Specifications for water crossings are left up to the Company and checked for adequacy by the Ministry during the general inspection. During ground and aerial inspections, the Committee noticed that crossings on primary and secondary roads were well-constructed. However, in a few cases temporary winter crossings were not completely removed from tertiary roads. The Company should inspect these crossings after spring break-up to ensure that all the logs used in these bridges have been removed.

2.6 COMPANY RECORDS

The Committee found that the silvicultural records pertaining to three separate planting, site preparation and tending areas were correctly recorded, tallied and mapped. The projects were visited in the field and checked against the office records and found to be in good order.

The silvicultural records were easy to find and track. The Company presently maintains two record-keeping systems for silvicultural work. One is used to facilitate the preparation of invoices to be sent to the Ministry for payment. Silvicultural projects are delineated on township maps, and map prints are kept in binders along with project cards describing the work. The other system is a computerized silvicultural information system developed by the Company to keep track of successive operations on the same piece of ground in the Iroquois Falls Forest. Depletions are also recorded on maps.

The Company and the Ministry are committed to working toward one record-keeping system. The Company has invested in Geographic Information System (GIS) technology to facilitate more effective management of the Iroquois Falls Forest. The Company's GIS, which will be fully operational within a year, will further improve the recording and reporting of silvicultural work and depletions. It will complement the Ministry's GIS and enable records to be quickly and accurately transferred between the two parties.

2.7 ANNUAL REPORTS

Paragraph 38 of the Agreement requires that the Company prepare an Annual Report in accordance with the Forest Management Manual summarizing certain aspects of operations during the preceding year.

Annual reports of operations on the Iroquois Falls Forest were submitted by the Company on time, or early in some cases. Reports were approved quickly because Ministry staff had their own up-to-date records and differences were reconciled before the official submission of reports.

Except for a few minor clerical errors, annual reports appeared to be accurate and consistent from year-to-year. The reports showed all payments received from the Ministry for roads and silvicultural work during 1985-90. Each payment reported was supported by an invoice in Company files.

To accurately report depletions, the Company determines the location and size of depletions using aerial photographs. The harvested areas are superimposed on maps. The depleted portion of each stand is then digitized and measured with an electronic planimeter. This data will be eventually incorporated into the Company's GIS.

The planning manuals require only tabular summaries of operations. Therefore annual reports consisted of tables and no written report was made. It would simplify the review process and facilitate the preparation of other plans e.g. the Report on Past Forest Operations, if a written report was supplied annually.

RECOMMENDATION: That Annual Reports include a descriptive section to record the year's highlights including an explanation of deviations from target achievements, amendments, and other significant events. In addition, that the Ministry formally acknowledge the receipt of Annual Reports and approvals for completeness and accuracy.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 13 of the ground rules of the Agreement, entitled Modified Management Areas (MMAs), explains how the Ministry and the Company will manage certain lands to meet objectives other than or in addition to the production of wood fibre. The Agreement recognizes two types of Modified Management Areas:

- linear MMAs - those that are located along water courses and roads, and,
- non-linear MMAs - which encompass mainly wildlife habitat.

Modified Management Areas have been replaced by the Area of Concern (AOC) planning process.

The Ministry prepared a supplement to the Operating Plan outlining details of specific MMAs which were established during 1985-90 to protect eagle and osprey nests, heronries, moose concentration areas, and fish habitat. Outpost camps, cottages, access points, routes and archaeological sites were also encompassed by MMAs. For the period under review, MMAs were delineated as reserves.

Harvesting followed by forest renewal can benefit many species of wildlife. Thus, some MMAs were intended to be temporarily reserved from regular harvesting (e.g., corridors allowing movement of wildlife between patches of mature timber). However, it is doubtful that these areas will be cut by the Company before the next rotation, considering the high cost of returning to retrieve small volumes of wood.

The Company did a good job of delineating MMAs in the field; only two minor trespass charges were levied by the Ministry.

Field inspections revealed that clearcut size reflected the standards of the five-year period under review. The effective size of clearcuts was reduced by rolling terrain in some areas, wildlife corridors, and the natural interspersion of stands of different age and site class.

The Company appears to be committed to effective integrated management of the Iroquois Falls Forest. For example, representatives of the Company have attended seminars on the use of GIS for wildlife habitat modeling. This will enable them in the future to determine the possible impact of different timber harvesting strategies on wildlife and to better integrate management of these resources. During the period under review, the Company participated actively in public information sessions and the resolution of specific conflicts related to proposed activities of the Company on the Agreement area. Partly for aesthetic purposes, the Company has made an effort to rehabilitate old landings and logging camps. To enable the public to better understand management strategies used in the Iroquois Falls Forest, the Ministry and the Company prepared materials for a 54-stop self-guided tour showing the effects of a wide variety of forest management practices.

During preparation of the new Timber Management Plan (TMP), representatives of the Company and the Ministry determined the possible impact of regular forestry practices and evaluated three possible prescriptions for each of the 313 AOCs in the vicinity of stands scheduled for harvest in 1990-95. The Committee feels this illustrates the Company's continued regard for other users and uses of the forest.

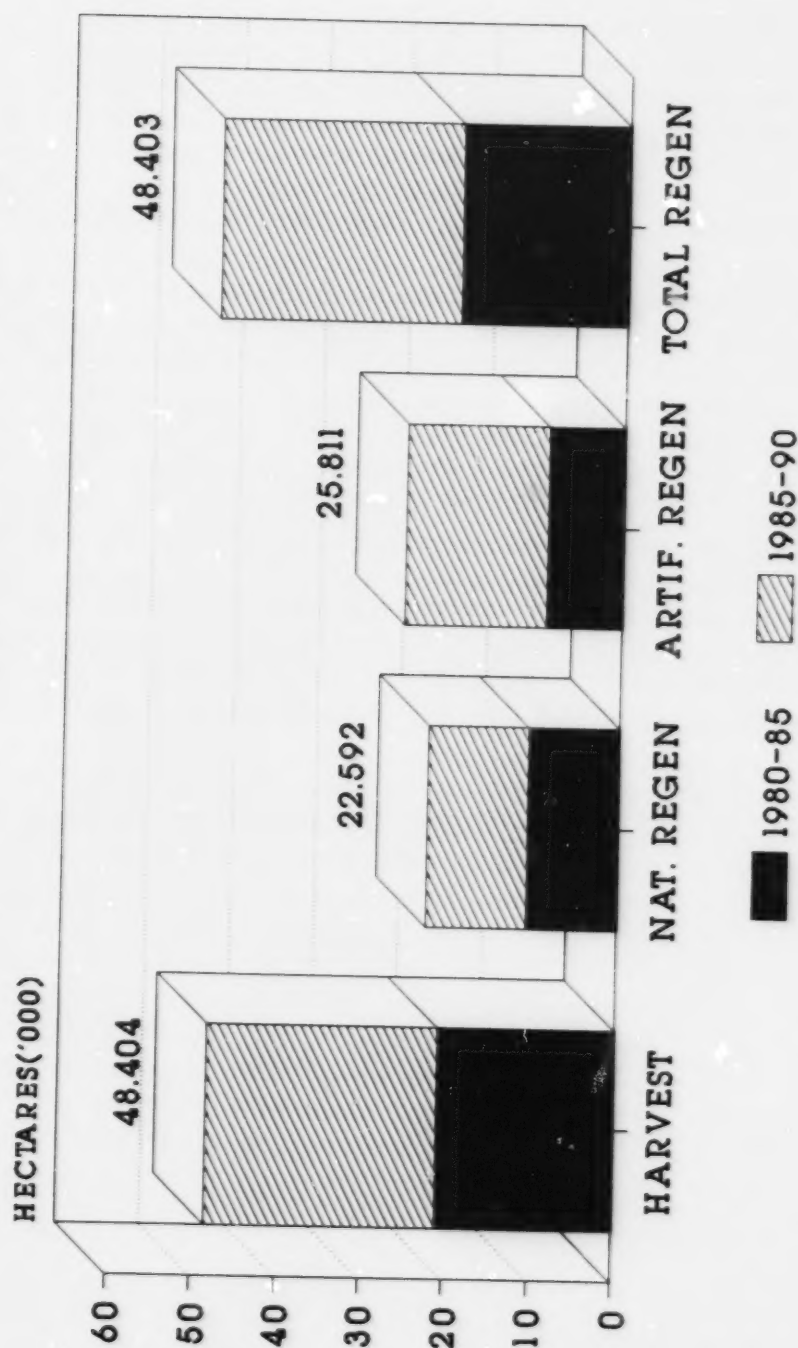
The Company has a positive attitude toward other uses and users of the Iroquois Falls Forest and is commended for their co-operation with the Ministry in this respect.

3. MAINTENANCE OF PRODUCTIVITY

During the five-year term, an area equivalent to 103% of the area harvested was regenerated by seeding, planting, or natural regeneration (Figure 3).

Both Company-released Free-to-Grow (FTG) areas and MNR-approved FTG areas were examined and visited. At the time of the review 10,790 hectares had been assessed and approved by the Designated Crown Representative (DCR), but the approved FTG areas had not been placed back into the forest resource inventory as productive forest land in the 1-20 year age class. In April, 1990 the Company had submitted 18,000 hectares for FTG assessment and approval. Field inspections by the Committee suggested that a significant portion of these areas could have been submitted and approved within a shorter time frame to more accurately reflect the status of the forest land base.

FIGURE 3: 1980-1990
HARVEST AND REGENERATION
FMA 500200 IROQUOIS FALLS FOREST



RECOMMENDATION: That the Company release as soon as possible and the MNR expeditiously assess and approve, FTG areas for inclusion back into the productive forest land base.

Growth and yield data for the new forest (the approved FTG areas) is required to determine if it is in balance with the timber cut (i.e., is the forest being harvested and regenerated on a sustained yield basis). The Committee can report that on an area basis, renewal is keeping current with the level of harvest. In addition, NSR areas are being placed back into the production forest area. The next five-year period should provide data to quantify growth from the plantations and determine sustainability. The Committee noted that the Company is participating in the development of a provincial growth and yield strategy with the Ontario Forest Research Council.

The Company in conjunction with Forestry Canada and the Northern Region of the Ministry has developed a modelling system for use in the Timber Management Planning process. The model, called the Harvest Schedule Generator (HSG), is a volume based forest harvest modeling tool. The Committee had insufficient time to analyse in detail the workings of the model or any of the assumptions concerning the forest base that are used in the model. The Company is actively involved in the development of expertise and knowledge of its forestry staff that will allow a wide variety of long term wood supply strategies to be analysed and tested for use on the Iroquois Falls Forest.

The Company co-operates with two other companies and the Ministry (through the Ontario Tree Improvement Council) in the maintenance of a seed orchard for genetically superior stock at Ramore, Ontario. On their own Agreement area, the Company has two "family" test sites. These sites are used to field test 400 families of black spruce for the purpose of roguing the seed orchard at Ramore.

4. IMPLEMENTATION OF THE RECOMMENDATIONS OF THE FIRST FIVE-YEAR REVIEW

The recommendations resulting from the first five-year review of operations of the Company in the Iroquois Falls Forest and the status of their implementation are as follows:

The Company has met its obligations under the Agreement. Therefore it is recommended that the Agreement be extended for a further five years.

The Agreement was extended by the Minister.

The Ministry should investigate the Company's record system in detail and remove itself from maintaining duplicate project records.

As noted in Section 2.6, Company Records, the Company and Ministry are working toward a single, modern record keeping system.

The Company and Ministry should continue to address each other's roles and responsibilities on a land base serving many users, as well as the related economic questions of where to best invest FMA funding.

The recommendation suggests that the Company and the Ministry seek a more co-operative approach to management within a framework of diverse needs and values, however this has not been entirely realized. It must be recognized that the role and responsibility of the Company and the Ministry will differ when allocating land use.

5. COMPANY CONCERNS

The Company was provided with the opportunity to express any concerns it had with regard to FMA 500200 or with regard to the Ministry's administration of the Agreement. Senior management of the Company responsible for administering this Agreement were satisfied with its implementation over the last five years.

The Company's concerns are as follows:

- i) Continuity of MNR Staff - The Company has enjoyed a good working relationship with both the Regional and District MNR staff. Of particular benefit to the smooth administration of the FMA has been the continuity of the Designated Crown Representative. FMA 500200 is the oldest FMA, yet is probably the only FMA in the province to have retained its original crown representative. Continuity of Ministry personnel has otherwise been poor. Since the signing of the FMA in April 1980, there have been four District Managers and six Regional Foresters.
- ii) Planting Stock - Planting stock quality has been a concern, with some stock not satisfying Company expectations. However, this was the exception rather than the rule.
- iii) Utilization Standards - Ministry attempts to penalize the Company for not meeting newly created utilization standards was regarded as inequitable in some situations, particularly where the Company was salvaging blowdown areas. (This is a problem in other FMAs as well.)
- iv) Gravel Pits - The Company objects to the imposition of new requirements for gravel pits under the new Aggregate Resources Act, particularly the payment of royalties and rehabilitation security. The objection to royalty payments is, that all roads built under the FMA are not the property of the Company but are public roads and therefore the royalty should not apply. The objection to the rehabilitation security is that the Company has been operating in the region for 75 years and should not be considered a "bad risk". (It is recognized that this matter is not peculiar to this FMA but rather to all FMAs. This matter is currently under review by the Ministry in consultation with the industry).
- v) Declared Surplus - The handling of the "surplus" MAD question has been equitable, although not totally without problems. On the positive side, the Ministry allowed the Company to rationalize its need to carry forward current softwood surplus into future periods rather than allocate it to a third party, in spite of considerable outside pressure for wood sources. In one particular instance, the Company found itself unable to harvest, or attract a third party to harvest, a large block of jack pine

that was found to contain high levels of cull. As this occurred near the end of the five-year term, there was not sufficient time to effect a plan amendment and it appeared that the Company would find itself in an undeclared surplus situation. On presentation of the facts, the Ministry very reasonably allowed the Company to "write off" the pine as a natural depletion, thus avoiding liquidated damages liability. On the other hand, the Company co-operated fully with Ministry wishes to allocate the large surplus in poplar to a third party, but the Ministry later denied the third party to market that poplar in the province of Quebec when the third party had difficulties with the Ontario market. The result was that the poplar harvest did not happen, and what is technically an "undeclared surplus" resulted.

vi) Quebec Access - The ability of the Company to manage the timber resources of the Iroquois Falls Forest has not been as autonomous as it could have been. Because of Ministry concerns over illegal moose hunting by Quebec residents, there was considerable resistance against a proposal that had a large third party access and operate an area within the FMA from points inside Quebec. The proposal was finally accepted only with considerable and expensive concessions from the third party.

6. CONCLUSIONS AND RECOMMENDATIONS

The Committee is satisfied that the obligations of the Company under the Agreement have been satisfactorily performed by the Company during the five-year term under review. In particular the Committee was impressed by the commitment of the Company to effective integrated management of the Iroquois Falls Forest.

The following are the Committee's recommendations:

RECOMMENDATION NO.1 : That the Minister extend the remaining periods of FMA 500200 by a further term of five consecutive years to March 31, 2010.

RECOMMENDATION NO.2 : The Ministry should require that in a third party agreement and/or third party licence between a FMA holder and a third party operator, the third party is responsible for over cutting or under cutting as defined in the Agreement, and that such third party be liable for any remedial action or liquidated damages specified in the Agreement, paragraph 20. The third party should have recourse, if applicable, to adjustments similar to those provided for in paragraph 20(2), 20(6), 40(1) and 44(1,2) of the Agreement.

RECOMMENDATION NO.3 : That the Company provide accurate data for estimated and actual yields on a more detailed basis for Timber Management Planning purposes.

RECOMMENDATION NO.4 : That the Ministry ensure the FRI be revised and updated incorporating the Company data to accurately reflect the productive forest land base.

RECOMMENDATION NO.5 : That annual reports include a descriptive section to record the year's highlights including an explanation of deviations from target achievements, amendments, and other significant events. In addition, that the Ministry formally acknowledge the receipt of annual reports and approvals for completeness and accuracy.

RECOMMENDATION NO.6 : That the Company release as soon as possible and the MNR expeditiously assess and approve, FTG areas for inclusion back into the productive forest land base.

7. REVIEW COMMITTEE STATEMENT

We have examined the performance of Abitibi-Price Inc. as pertaining to its obligations under Forest Management Agreement No. 500200 (Iroquois Falls Forest) during the past five-year period ended March 31, 1990.

In our opinion, the Company has conformed to the rules as outlined in the Forest Management Agreement.

signed The Review Committee

The Review Committee

SECOND FIVE-YEAR REVIEW
CANADIAN PACIFIC FOREST PRODUCTS LTD.

ENGLISH RIVER FOREST
FMA 500300

1985-1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Ministry of Natural Resources (the "Ministry") and Great Lakes Forest Products Ltd. (the "Company") signed a Forest Management Agreement or FMA (the "Agreement") on June 20, 1980. This Agreement, number 500300, was designated the **ENGLISH RIVER FOREST**. The purpose of this Agreement was to provide a continuous supply of forest products for the wood processing plants of the Company at Thunder Bay and Dryden, Ontario and to ensure that the English River Forest is harvested and regenerated to produce successive crops of timber on a sustained yield basis.

A review of the first five consecutive years of the Agreement was conducted on the English River Forest in 1985. As a result of a favourable report of Company performance of its obligations under the Agreement, the Ministry extended the remaining period of the Agreement for a further term of five years, effective April 1, 1985.

In 1989, as a result of a change in ownership, the name of the Company was changed and all obligations under the FMA were transferred to Canadian Pacific Forest Products Ltd.

The review of the second five-year period of the Agreement was conducted on the English River Forest to determine whether the obligations of the Company under the Agreement have been satisfactorily performed and to recommend to the Minister of Natural Resources whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of four (the "Committee"), engaged by the Ministry for this purpose. The four committee members were:

- Mr. John M. Duncanson, B.Sc.F., R.P.F.,
Duncanson Investment Research, Review Co-ordinator.
- Mr. Victor I. Sleep, B.Sc.F., R.P.F.,
Manager of Forestry Services (Retired),
Spruce Falls Power and Paper Company Ltd.,
Committee Chairman.
- Mr. Adrian M. van Fraassen, B.Sc.F.,
Manager Forest Management Planning Section, Timber Sales Branch (Retired),
Ministry of Natural Resources.
- Mr. Bernie W. Muncaster, M.Sc.,
Aquatic Biologist,
Ecological Services for Planning Ltd.

1.3 TASKS OF THE REVIEW COMMITTEE

The Committee's assignment was to undertake a fair and objective review of Canadian Pacific Forest Products Ltd. performance on the English River Forest during the second five-year term vis-a-vis its obligations under Forest Management Agreement 500300 and to make recommendations to the Ministry on the extension of the Agreement's term according to the "evergreen" section of the Agreement.

The review was conducted by:

- examining the management, operating, and annual plans, and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural and access road records for adequacy and for conformity with the management plans and ground rules of the Agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provisions of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects and road construction typical of the techniques employed on the forest for conformity with the Agreement holder's records and for field applications of the ground rules,
- determining the degree to which other forest users and other forest values are accommodated in management planning and in field operations,
- meeting with Company and Ministry district staff to identify problem areas and Agreement concerns on the part of either party, and,
- as specified in detail in Appendix A - "Terms of Reference for the Second Five-Year Review of a Forest Management Agreement".

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION AND SUBMISSION OF THE PLAN

The Agreement requires the Company to prepare management and operating plan, and a series of annual plans and annual reports to guide the Company's harvest, renewal and maintenance operations on the English River Forest.

These plans and reports must be prepared in accordance with the planning manuals published by the Ministry for this purpose, and they must be submitted to the Ministry and approved by the Ministry within the time frames set in the Agreement.

The 1985-90 Operating Plan for the English River Forest was submitted on January 10, 1985, three months late. After review and comments by the Ministry and the Public leading to necessary alterations, the Company re-submitted the plan on January 10, 1986. The plan was subsequently approved on February 20, 1986.

In an effort to integrate environmental concerns with the existing planning process and structure, on January 1, 1986 the Ministry published a new planning manual Timber Management Planning Manual for Crown Lands in Ontario which replaced the planning manual in use for the preparation of management and annual plans and annual reports for Forest Management Agreement areas.

The format and content requirements as well as the planning process described in the Timber Management Plan (TMP) manual took effect on the scheduled date. Consequently the 1990-1995 Timber Management Plan was prepared and submitted in accordance with the new TMP manual.

The 1990-95 TMP (replacing the former management and operating plans) was submitted on September 15, 1989, two weeks early. Following Ministry and public review, the Company re-submitted the Plan with alterations on February 1, 1990. The Plan was approved by the Ministry on February 20, 1990, well in time for the 1990-95 Company operations commencing on April 1, 1990. This is all the more remarkable since plan content and the planning process has increased in complexity during the last few years. The success can be attributed to excellent Company and Ministry co-operation which allowed issues to be resolved and alterations to be made quickly. Both the Company and Ignace District Ministry Staff are to be commended for their efforts in this planning exercise. The 1987-1988 Annual Work Schedule (and all annual plans and annual reports thereafter) was prepared and submitted in accordance with the TMP manual and subsequently approved within the time frame specified in the Agreement. The "planned" figures used in this review were those submitted in the original operating plan.

2.1.2 PLAN IMPLEMENTATION

The Agreement requires that the Company conduct its operations in accordance with the approved management, operating, and annual plans.

To keep the plans current during their implementation, the new TMP manual provides for a formal process to amend the Timber Management Plan and the Annual Work Schedule when changing circumstances require the plans to be amended. Consequently the Operating Plan has had two major and six administrative amendments involving relocation of harvest areas and roads. The salvage of blowdown timber and the declaration of additional surplus due to the closing of the waferboard mill were the principal reasons for the amendments.

It should be noted that the Company, in an effort to keep the annual plans up-to-date, requested and received approval for a number of amendments to the annual plan to allow for adjustments to the annual harvest operation and road construction. The quick response to their amendment requests is another example of the excellent co-operation which exists between local Company and Ministry staff.

The accomplishments of the Company in the English River Forest in silviculture operations and road construction and maintenance paid for by the Ministry are summarized in Table 1. The Company site prepared 131 hectares and seeded 5 hectares at its own expense.

The Committee examined the harvest, road construction and maintenance, and silviculture records of the Company and found them to be in conformity with the areas specified in the approved operating and annual plans.

The levels of harvest, regeneration, site preparation, tending and road construction in comparison with the 1985-90 Operating Plan are shown in Figure 1.

The actual levels of all activities were below planned levels. The harvest shortfall in the conifer working groups was primarily due to an accelerated harvest in the Thunder Bay district in order to salvage timber from stands damaged by budworm. This reduced the need for conifer from the English River Forest. The closing of the Company's waferboard plant caused a reduction in the need for poplar. As a result of the shortfall in harvest area less area became available for the sequential activities of site preparation and artificial regeneration. With regard to tending, the shortfall was due to the difficulty of forecasting five years in advance which areas will require treatment. In addition many areas which require release tend to be small, therefore it is necessary to accumulate these areas until it is feasible to initiate an economical tending program.

2.2 THE GROUND RULES

2.2.1 KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

Based on discussions held with the Company, both in the office and in the field, it was apparent that the Company staff were knowledgeable and familiar with the provisions of the ground rules and the Agreement.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

The Committee's examination of silvicultural records, its field inspections and its discussions with Ministry staff confirmed that harvesting and silvicultural operations have been in accordance with the ground rules.

The ground rules permit the classification of non-treatable sites by mutual agreement. Any area may be classed as non-treatable where extremes in topography, shallowness of soil, excessive rock, poor drainage or inaccessibility make it uneconomic or impractical to treat. Non-treatable areas either

Table 1

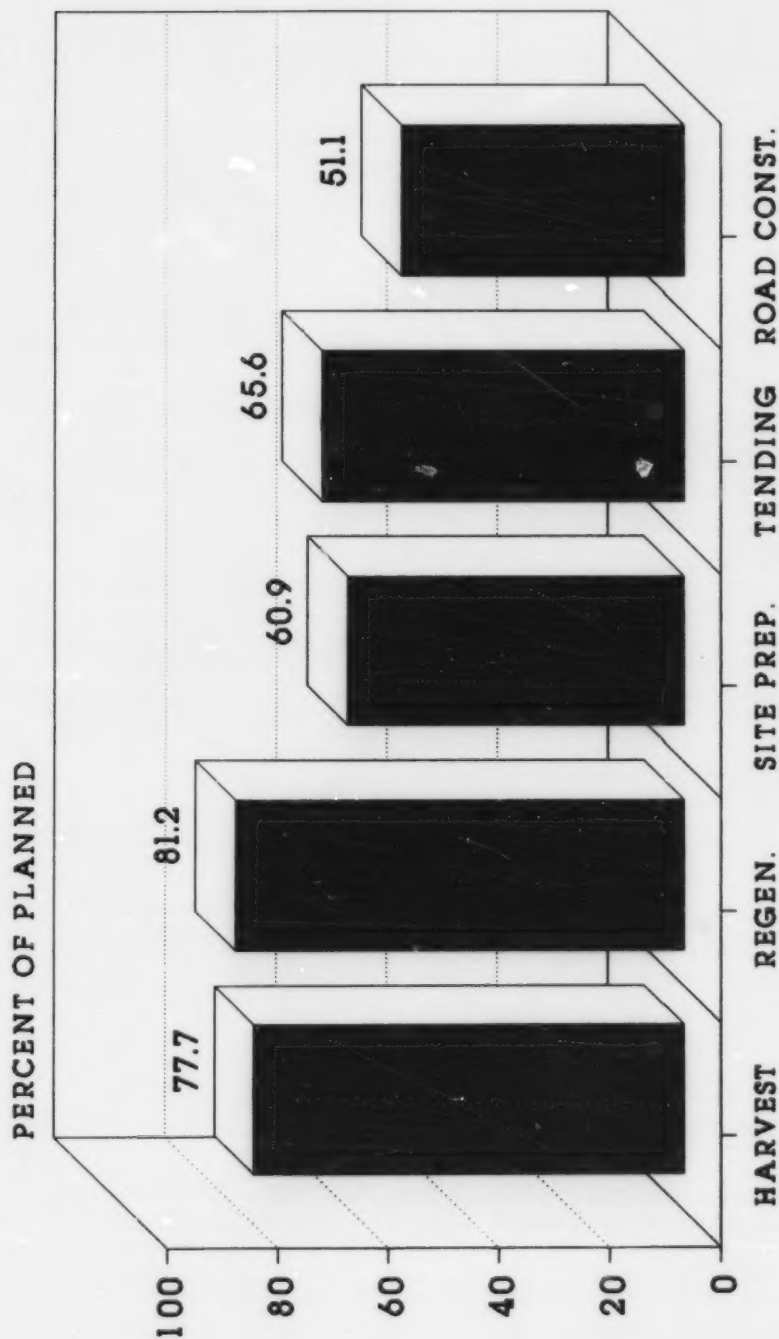
Summary of Company Forest Operations with Ministry Funding

FMA Expenditure and
Accomplishment Report
For The Five-Year Period
1985 - 1990

FMA 500300
English River Forest
Canadian Pacific Forest
Products Ltd.

Activity	AREA (hectares)	COST (dollars)
Harvest	25,368	
Natural Regeneration	885	
Artificial Regeneration		
- Planting Bareroot	1,457	
- Planting Container	3,173	
- Seeding Direct/Other	12,542	
Total Regeneration	18,057	\$ 2,103,683
Retreatment	0	
Site Preparation		
- Mechanical	13,542	
- Chemical	0	
- Prescribed Burning	1,349	
Total Site Preparation	14,891	\$ 3,437,782
Tending		
- Chemical Cleaning	1,411	
- Manual Cleaning	0	
- Thinning	0	
Total Tending	1,411	\$ 180,036
TOTAL SILVICULTURAL PAYMENTS		\$ 5,721,501
	(kilometres)	
Road Construction		
- Primary	16.7	
- Secondary	73.7	
Total Road Construction	90.4	\$ 1,396,490
Road Maintenance	524.2	\$ 232,814
TOTAL ROAD PAYMENTS		\$ 1,629,304
TOTAL PAYMENTS		\$ 7,350,805

**FIGURE 1: COMPARISON OF 1985-1990
OPERATING PLAN VS. ACTUAL
FMA 500300 ENGLISH RIVER FOREST**



Source: Annual Reports,
1985-90 Operating Plan.

allocated for harvesting in the operating plan or depleted for other reasons during the operating plan period were to be included in the depletion section of the annual report. During the review period no non-treatable areas were reported.

Summary Table 4.4.4 in the five-year Summary Report shows total natural regeneration for the 1985-90 period to be 885 ha.

The Committee is concerned that non-treatable areas and areas which are expected to regenerate without treatment have not been properly classified and reported, and therefore the records are incomplete. This circumstance may complicate future decisions and result in disputes with respect to treatment and retreatment obligations.

The ground rules for the 1990-95 period include a strategy proposal entitled, "Landbase Track", the details of which are to be established by a joint task force of Company and Ministry staff during the 1990-91 fiscal year. Implementation of this plan should ensure that all areas depleted are properly classified and reported.

RECOMMENDATION: That the Company review the areas operated during the 1985-90 period using the landbase tracking procedures to ensure that the identification of "untreatable" and "natural regeneration" areas is correct and complete, and to make appropriate revisions to the records.

The Committee was provided with the opportunity to visit and inspect selected operations on the ground and to gain an overview of the English River Forest from the air. The Committee observed and was impressed by the many examples of successful site preparation, planting and seeding on areas of intensive treatment, these being primarily in the jack pine working group and other working groups where the jack pine was a significant proportion of the total volume. Planting and seeding of jack pine on pure jack pine sites and adjacent sites where jack pine was a major component constituted 85% of the 1985-90 regeneration effort. This will not produce any significant change in the distribution of species. It is estimated that many areas will reach Free-to-Grow (FTG) status in 10 years.

In the Melnyk Lake region the Committee observed an area which had contained scattered or small groups of red pine which were harvested over the last 10 years by third party operator, R.W. Kangas. The harvested areas were site prepared and replanted with red pine with excellent success. The Committee was told that Mr. Kangas has done this at his own initiative and at his own expense. Mr. Kangas should be commended for his efforts.

Harvest and regeneration of lowland spruce in the spruce working group by strip cut and natural regeneration appears to be successful. It is estimated that it will take more than 10 years before FTG status is reached and the leave strips can be cut. Less than 5% of the regeneration effort during the 1985-90 period consists of this practice.

Field inspection of disc trencher site preparation in progress in the Heathwalt area showed this type of equipment is effective on a wide variety of site conditions. A few instances of ponding indicate the need to instruct the machine operators on the importance of maintaining original drainage patterns.

Where the Company is attempting to convert stands of the balsam fir and hardwood working groups which are characterized by comparatively heavy competition, and particularly those areas where spruce has been planted, there appears to be some indecision concerning the need for release of the planted trees. If it has not already been done it would be advisable to conduct trials to compare the results with and without release treatment. Experience elsewhere would indicate that two or three treatments may be required to bring the planted spruce to the FTG state.

RECOMMENDATION: That the Company review its prescription for areas to be converted from the balsam fir and hardwood working groups to jack pine and/or spruce, and particularly, the need for early release and follow-up treatments.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

The invoicing procedures of the Company were found to be in conformity with those specified in the ground rules. Reconciliation of hectares treated, number of trees planted, or kilometres of roads constructed and/or maintained were done at the field level prior to submission of the invoice and subsequent approval.

2.2.4 PREPARATION OF NEW GROUND RULES

The Agreement with the Company requires both parties to commence preparation of new ground rules for the next five-year term at least eight months prior to the expiry of the old ground rules, and to agree upon those new ground rules on or before the expiry date of March 31, 1990.

The preparation of the new ground rules commenced on time and an Agreement in Principle was confirmed by the Company in a letter to the Ministry dated June 26, 1990. The following recommendation is a repetition of the one submitted in the first five-year review.

RECOMMENDATION: That the Company and the Ministry ensure that in the future the approval process for the ground rules is completed by the required date.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS AND WOOD FLOW

According to paragraph 20(1) of the Agreement, the Company has agreed to maintain its harvest on the English River Forest at a level between 90 percent and 110 percent of the calculated allowable depletion (allowable cut) for each working group. The Company may request the Ministry to authorize variations to the levels specified in the Agreement.

Paragraphs 20(3) and 20(4) of the Agreement provide for either a remedy or liquidated damages in the event of an overcut or undercut, respectively, on the Agreement area. The Agreement holder may avoid liquidated damages through the declaration of timber surplus to its needs in an approved Management Plan (paragraph 20(6)).

Under the terms of the TMP Manual, the Annual Depletion Report must be submitted by November 15 of the year following the harvest. The depletion report referred to for the purpose of this review was a preliminary one. Major changes are not anticipated in the final report. Therefore the conclusions and comparisons which have been derived are expected to remain valid. The "Calculation of Area Subject to Damage for Overcutting or Undercutting" (Table C.2, p 210 of the TMP manual) cannot be completed for this audit until the final depletion report for 1989-90 is submitted on November 15, 1990.

RECOMMENDATION: That following the submission of the Final Depletion Report for the 1985-90 period by the Company, on or before November 15, 1990, the Ministry shall complete Table C.2 - "Calculation of Area Subject to Damages" (Section 10.0 of the TMP Manual) and review the results with the Company.

The harvest during the 1985-90 period was 78% of the planned harvest area (Figure 1) and 65% of the Maximum Allowable Depletion (MAD). The shortfall in the conifer working group was due to changes in the Company's Dryden and Thunder Bay operations which resulted in a reduction in volume required from the English River Forest. The allocation for conifer was not amended because of the difficulty in predicting the consequences of the changes in the Dryden and Thunder Bay operations. It was thought possible that the reduction in yield per hectare might substantially offset the reduction in volumes required from the English River Forest. The closing of the Company's waferboard mill in 1986 eliminated that poplar assignment. The Operating Plan was amended to increase the declared surplus of poplar but markets did not materialize for it or for the surplus white birch. The shortfall in the red and white pine area was due to an over-allocation in the plan to allow flexibility in the operations of R.W. Kangas, the only third party operator on the English River Forest.

The average yield per hectare during the five-year period was 84% of the planned yield and 86% of the actual 1980-85 average. The planned volume used in the 1990-95 TMP, excluding the Kangas operation, is 97% of the 1985-90 actual yield.

The actual total volume of timber produced from Company operations on the English River Forest was 65% of the planned volume. Approximately 86% was delivered to the Company's Thunder Bay mills, 12% to the Company's Dryden mills and the balance to sawmills operated by third parties. Table 2 and Figure 2 show a comparison of planned versus actual depletion.

The Committee commends the Company and the Ministry for their attempts to find markets for the surplus of timber which developed during the period. The 1990-95 TMP includes strategies intended to enable the Company to meet the MAD for the conifer working groups. Both mill complexes will utilize poplar. This will help to ensure utilization of poplar from the English River Forest. White birch is unlikely to be utilized unless new markets develop. Under-utilized species will be declared as surplus, and made available to other parties.

TABLE 2
Depletion of Agreement Area for 1985 - 1990
(hectares)

FMA 500300
English River Forest
Canadian Pacific Forest
Products Ltd.

Working Group	Maximum Allowable Depletion	Declared Surplus	Planned Harvest	Actual Harvest	Actual Depletion	Difference Plan - Act Harvest
Spruce	11,825	-	12,689	11,576	12,444	+1,113
Fir	5,910	1,980	3,981	2,068	2,249	+1,913
Jack Pine	14,225	36	13,682	11,320	12,763	+2,362
Other Conifer	-	-	-	5	5	-5
Red/White Pine	100	-	463	185	196	+278
Poplar	4,930	3,880	1,838	1,151	1,340	+687
Birch	2,080	2,080	-	333	408	-333
Non-Productive	-	-	-	515	515	-515
TOTAL	39,070	7,976	32,653	27,153	29,920	+5,500

- (1) Planned Harvest = Planned Depletion - Planned Reserves
 (2) Actual Harvest = Actual Cut + Bypass
 (3) Actual Depletion = Actual Harvest + Reserves + Non-Harvest Depletion

Note: Figures represent 4 years actual data and final year estimated data

Source: Table 4.1 Report of Depletion by Area 1985 - 90

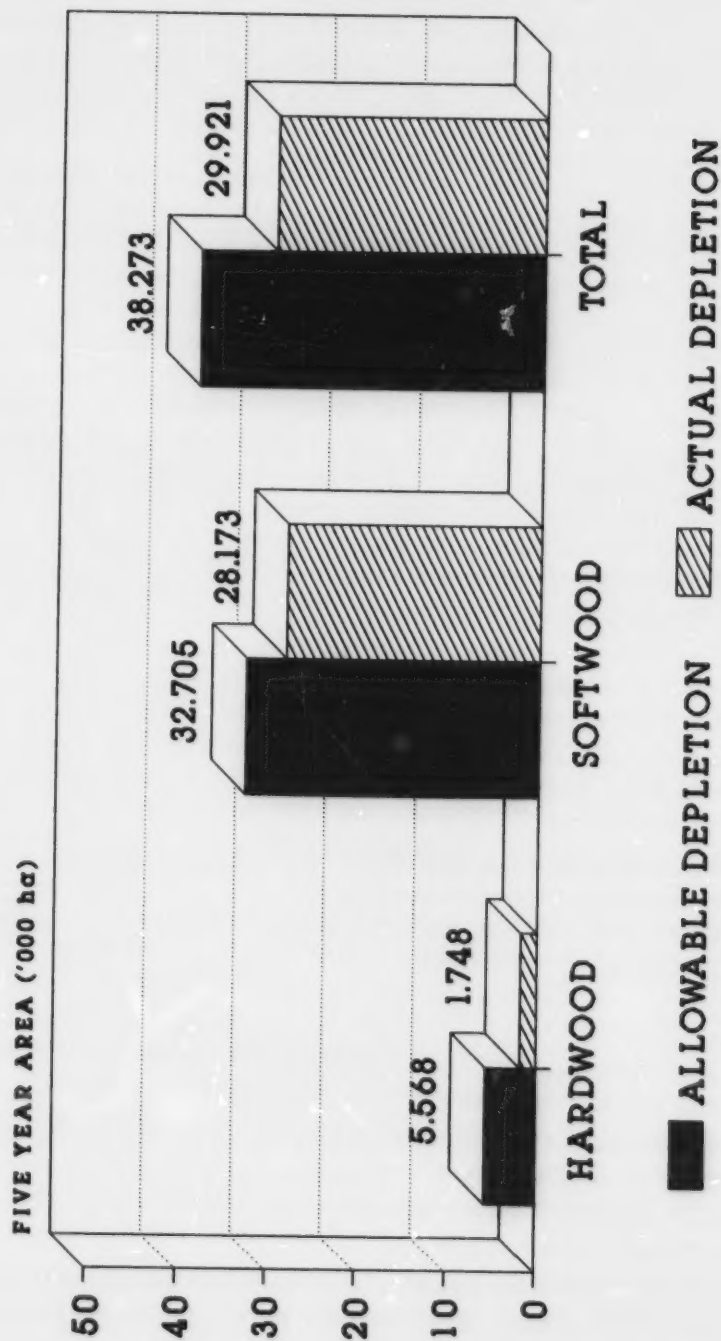
2.4 NSR OBLIGATIONS

Virtually 100% of the Company obligations for Not Satisfactorily Regenerated (NSR) lands were fulfilled in the first five-year period. A review of the original survey indicates that there may be small additional areas operated prior to the signing of the FMA, not encompassed in the survey coverage, which may require treatment. Such areas will be included as they are encountered within range of the ongoing Company renewal projects.

2.5 ROAD CONSTRUCTION

Paragraph 31 of the Agreement provides for the Ministry to pay, subject to a maximum per kilometre, for the construction or reconstruction of forest access roads on the Agreement area. To be eligible for payment, roads must be detailed in an approved Annual Plan and constructed according to Schedule "E" of the ground rules in the Agreement.

**FIGURE 2: COMPARISON OF 1985-1990
ALLOWABLE VS. ACTUAL DEPLETION
FMA 500300 ENGLISH RIVER FOREST**



Note:
 Allow Depl-Plan Harvest & Surplus
 Act Depl-Act Harvest & Non-Harvest Depl

On the English River Forest, roads are constructed by the Company and inspected by a Ministry field representative. The Committee found no roads to be substandard for the 1985-90 period.

The access road network on the English River Forest is well developed, with silviculture demands for the 1985-90 period easily carried out and the majority of primary roads required for the 1990-95 harvest in place. As will be discussed in Section 2.8 of the review, the infrastructure conforms to the District Road Use Strategy by providing or limiting road access to other users as requested. The third party operator on the English River Forest generally followed the Company's harvest and thus the requirement for third party roads was reduced. Due to the existing highway network relatively few primary roads were required in the English River Forest.

The terrain covered by the English River Forest is generally flat with relatively few obstacles to road construction.

A total of 90 km of road construction or reconstruction was funded by the FMA in the English River Forest during the 1985-90 period (Table 1). This represented 51% of the roads planned for in the 1985-90 Operating Plan (Figure 1). Fifty-five percent of this shortfall was accounted for in an amendment dated November 27, 1987. On the English River Forest virtually all (99%) of the planned FMA-funded primary roads were constructed while 46% of the proposed secondary roads were built. The reduced amount of secondary road construction was due to roads built to tertiary standard rather than secondary standard as indicated in the original Operating Plan. A lower standard was required as a result of reduced haulage demand for the road than originally forecasted. The level of FMA road funding did not affect the number of roads built.

Recording of a road, after subgrade construction, and again after gravelling, resulted in double counting in total road kilometres in some annual reports. The invoice ("cost") amounts were correct and usually the double counting was a function of the design of Table 6.6 as outlined in the TMP manual. Correct road kilometres were reported in the five-year Summary Report.

The actual road maintenance on the English River Forest represented 209% of the distance planned in the 1985-90 Operating Plan. This increase was a result of some roads remaining in service for a longer period due to silviculture demands and the difficulty associated with predicting road maintenance requirements.

2.6 COMPANY RECORDS

The Company records of Forest Resource Inventory (FRI), forest depletions, access roads and silviculture projects for the English River Forest are kept in the Company's Woodlands Office in Thunder Bay.

The Committee was advised that the inventory data (stand listings) are periodically updated to ensure that depletion, Free-to-Grow stands, age classes and working groups are reflected in the five-year MAD calculations.

Depletion data is compiled on permanent depletion maps, colour coded for each category of depletion. The data is summarized for the annual report.

Silviculture data is compiled on cards by project number, base map and treatment type. Areas are plotted on base maps.

The project data is entered into the computer to generate the invoice for payment as well as summaries for the annual report and other company needs.

Five-year stocking assessments are entered in the computer, recording project number, treatment type, area, stocking percent, density, height, recommendation for retreatment, release, further treatment and Free-to-Grow status. Summaries are computer generated for annual reports and other company needs. The Committee examined the silvicultural project and assessment records and was satisfied that the required stocking assessments and Free-to-Grow assessments have been carried out. However, the Committee could not verify that areas declared Free-to-Grow were included in the updated FRI.

The Company has purchased the latest technology in computerized mapping and area related information systems and is presently applying this technology to the existing information system.

The Committee was favourably impressed and the Company should be commended for their progressive approach in adapting to the new technology.

Although the records of the individual activities appear to be complete and accurate, the Committee is concerned that no links exist in the record system between the individual activity records. When areas are under active management beginning with the harvest and through successive silviculture treatments ending with Free-to-Grow, it is important to know what the status is of the area during the active management period. The Geographic Information System (GIS) technology now available to the Company should be a helpful tool in managing this problem.

RECOMMENDATION: That the Company review its record system to ensure the necessary links between the forest resource inventory and the sequential management activities during the management period.

As a result of centralization of the management records in Thunder Bay, ready access by the Company and Ministry field foresters for ensuring completeness and accuracy as well as analysis for future planning, is difficult. In particular the Ministry expressed concern in this regard.

RECOMMENDATION: That the Company and the Ministry review the record keeping procedure to ensure appropriate and timely information flow to the satisfaction of both parties.

2.7 ANNUAL REPORTS

The Agreement requires the Agreement holder to prepare and submit an annual report in accordance with requirements set out in the Timber Management Planning Manual for Crown Land in Ontario.

The Company has submitted all annual reports within days of the due date, however, no record exists of receipt or approval by the Ministry. The Committee has been advised by the Ministry that the annual reports have presented no problem.

The annual reports, with the exception of the 1985/86 Report, consist only of the required tables with no written text indicating highlights or problem areas. The Company submitted to the Committee a listing of amendments to the Annual Work Schedules including date requested, date approved and reason for amendment. This was helpful to the Committee and could be included with each annual report.

The Committee has used these annual reports as the source data for this review and have found only minor errors.

RECOMMENDATION: That Annual Reports include a descriptive section to report the year's highlights including an explanation of target achievements, amendments, and other significant events. In addition, that the Ministry formally acknowledge the receipt of Annual Reports and approvals for completeness and accuracy.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 15 of Schedule "C" (the ground rules) in the Agreement, entitled Modified Management Areas (MMAs), details areas which require particular management prescriptions for the production of timber in association with the maintenance or improvement of other resource values. These areas were to be identified during the preparation of the five-year Operating Plan. The Ministry, Company and others may identify the values to be protected.

The Company has worked extensively with cottagers and remote tourist operators on an individual basis to attempt to accommodate concerns associated with access. Examples of mitigation undertaken by the Company include seasonal restrictions on harvesting up to one kilometre from cottages or tourist operations; construction, at Company expense, of access roads for cottagers; removal of roads after harvesting and rerouting of planned roads.

The Company took the initiative to become an active participant on local committees with tourist and cottager associations to understand the concerns of these groups and express the Company's position.

The Committee feels that fish and wildlife interests have been accommodated in a satisfactory manner by the Company. More than fifty eagle nests have been identified, and reserves allocated, in the English River Forest. An osprey nest was retained during a prescribed burn by placing sprinklers around the tree containing the nest. A road near Sally Lake was rerouted when a heronry was

discovered. Reserves as outlined in the fisheries habitat guidelines have been implemented along lakes and streams.

There was excellent co-operation between the Company and the Ministry in implementing the moose habitat guidelines for the 1990-95 TMP plan. Non-allocated land was often used to satisfy the requirements of the guidelines. Individual blocks of land allotted for moose habitat were large enough to allow for future harvesting if approved.

The Committee observed some deficiencies with water crossings constructed during the first few years of the 1985-90 period. These problems included culverts placed too high, undersized culverts, erosion at culverts where no rip/rap or other bank stabilization was employed and roads washed out. Culverts were lacking on several tertiary roads. Newer crossings were built to the specifications of the revised guidelines for access roads and water crossings and as such lacked the erosion and water flow concerns associated with the older crossings. Bridge crossings, including those built by the third party operator, R.W. Kangas, were generally environmentally sound and well maintained.

The Ministry is to be commended for their role in working with the Company to improve stream crossings. Of particular benefit was a workshop prepared by the Ministry to demonstrate the potential impacts of crossings and proper construction techniques to management and operational personnel from the Company. It is important for the operational people from the Company to understand the implications of improper stream crossings.

The Company and the Ministry realize the need to protect intermittent watercourses. These streams usually do not appear on the National Topographic System 1:50,000 scale maps and hence the present guidelines are not applicable. Although seasonal, these streams can have a significant impact on water bodies downstream.

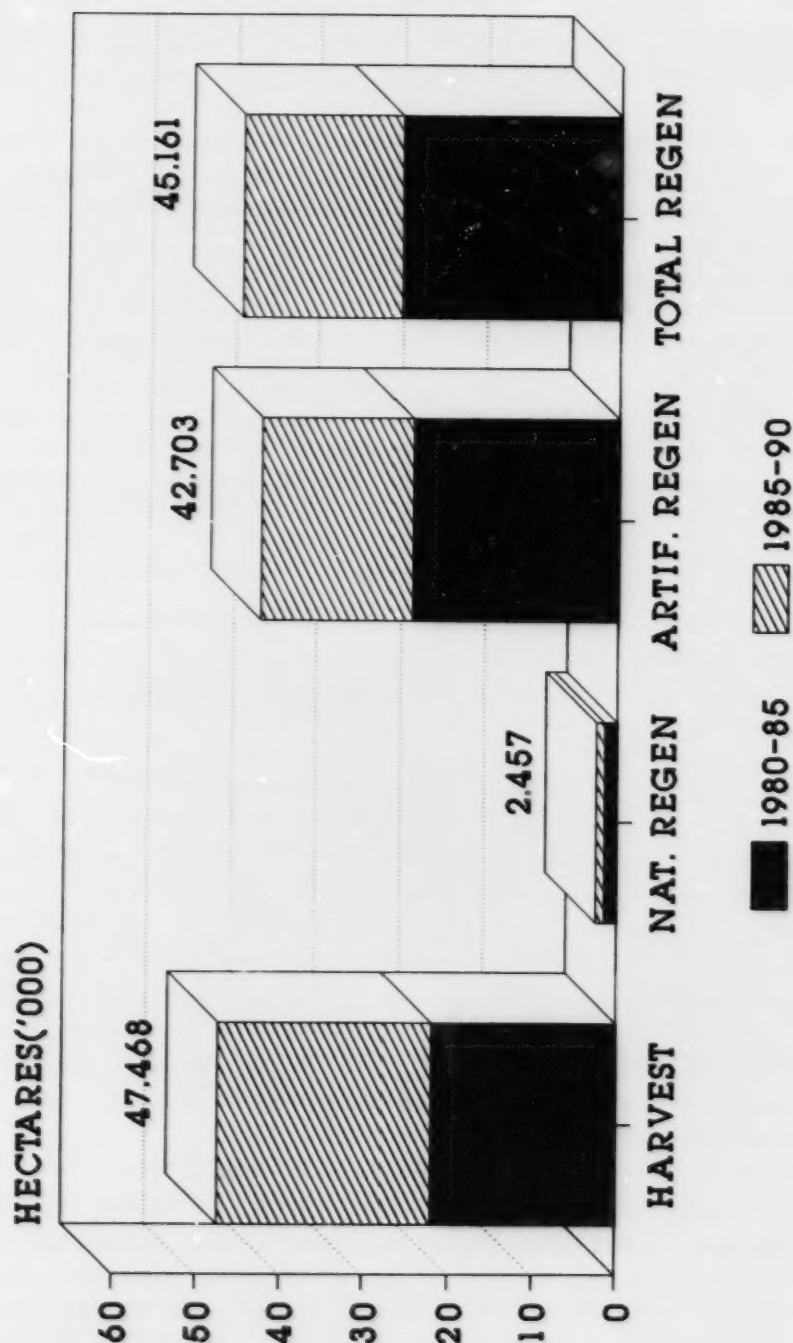
3. MAINTENANCE OF PRODUCTIVITY

Table 2 shows the maximum allowable depletion (MAD) which was calculated at the beginning of the 1985-90 term. Harvesting and other forest depletions were well within the obligations of the Agreement for all working groups. Regeneration treatment was applied to an area equivalent to 71% of the harvested area. Certain harvested areas have been designated with the expectation that natural regeneration will produce adequate stocking. Company staff were reluctant to identify natural regeneration areas until the fifth-year stocking assessments had been prepared. Consequently, many of these areas have not been included in the tables. The percent regenerated would have been greater had areas of natural regeneration been included as "regenerated area". The implementation of the "land base tracking procedure" should solve this problem.

Figure 3 presents a comparison of areas regenerated to areas of harvest cut. The area planted or seeded by artificial treatments during the first 10 years of the FMA was equivalent to 90% of the total area harvested. The percentage increases to 95% when natural regeneration is included.

It should also be understood that where artificial regeneration is prescribed there is a two-year delay between harvest and renewal during which the timber is removed and the area is prepared for

FIGURE 3: 1980-90
HARVEST AND REGENERATION
FMA 500300 ENGLISH RIVER FOREST



planting by site preparation. When consideration is given to this two-year lag, the accomplishment in terms of "percentage of available land given renewal treatment" is as follows (area in hectares):

AVAILABLE for RENEWAL *	22,962
ARTIFICIALLY REGENERATED	18,057
PERCENT of AVAILABLE	79%
* area available for renewal is equal to total 1983-88 harvest	

During the 1985-90 term of the Agreement, fifth-year stocking assessments were conducted in accordance to the ground rules. No "failed" areas requiring retreatment were identified. A total of 55,776 hectares of NSR and regenerated cutover was approved as Free-to-Grow.

Successful examples of natural regeneration were observed in the field and tracts of similar potential are known to be present in areas of recent cutover which will not be artificially treated. Future assessments are expected to reveal that the total renewal (artificial plus natural) has maintained the productivity of the timber production land base.

The Committee believes that the Company's current practice with respect to management of the land base, its renewal program and the potential of more intensive management techniques (release, cleaning, thinning) will increase the merchantable volume of timber per hectare of land being managed. The land base itself continues to shrink as land is withdrawn from timber production to provide for other uses and protect other values. The trend to a "50% cut/ 50% leave" practice will result in additional loss of timber due to windthrow and edge effects. Future total productivity of the Company forest will depend on the amount of land which remains dedicated to timber production.

The Committee was given a demonstration of the Company's new GIS. This system should help the Company to develop a comprehensive long term wood supply strategy.

RECOMMENDATION: That the Company in consultation with the Ministry monitor treatments as yet unproven, (i.e. conversions of an original working group, areas left for natural regeneration, and areas of extremely difficult topography) to determine at the earliest possible time the establishment of adequate stocking, or conversely, the need for extensive treatments to promote or enhance natural regeneration. Should certain sites prove to be untreatable at reasonable cost, serious consideration should be given to excluding such areas from harvest.

During the 1985-90 period the Ministry located over 400 "plus trees" and collected 4,000 hectolitres of cones. Seed orchards totalling 24 ha and family test plantations totalling 48 ha were maintained.

The Committee was impressed with the Forestry Division organization and silvicultural practices of the Company and commend the Company for those activities and as well for their initiatives in treating some areas and conducting research and development projects at their own expense.

4. IMPLEMENTATION OF THE RECOMMENDATIONS OF THE FIRST FIVE-YEAR REVIEW

The recommendations resulting from the first five-year review of operations of the Company in the English River Forest and the status of their implementation are as follows:

The Review Committee recommends that the Great Lakes Forest Products Ltd. English River FMA be extended for a further five-year term.

The Agreement was extended by the Minister.

The Review Committee recommends that the individual FMA holders be allowed to establish their own forest records systems as long as they can provide the required data within given time frames. The companies must have a system which can withstand public scrutiny. Duplication of record keeping should be eliminated. The Company and the Ministry should establish a reporting format that would eliminate duplication.

The Company silviculture records have been improved and can now provide the required data. The Company and Ministry, through the Land base Tracking initiative, will share the workload of data collection. The Company's GIS which is under development will ultimately provide state of the art data processing capability which should serve the needs of both parties. A computerized information system has the potential to reduce the need for duplication of records by the Ministry.

RECOMMENDATION: That the Company and the Ministry continue to explore ways and means by which to utilize the potential of the Company's GIS to satisfy the data requirements of both participants.

5. COMPANY CONCERNS

The Company strongly supports a continuation of the FMA form of licensing as it provides a degree of security of wood fibre for its mills at Dryden and Thunder Bay. The Agreement has given the Company and its employees, who form a major proportion of the population of the community of Ignace, an assurance that forest management continues on a long-term basis.

The Company and the Ministry have a mutual commitment to forest management that the Company believes is reflected in an improved public image of both parties working together for the betterment of Ontario's forests.

The concern of the Company is that this improvement be allowed to continue. It is with this in mind that the Company suggests the following improvements:

- i) Continuity of MNR Staff - The Company recognizes that the Ministry must continue to be a dynamic force with on-going personnel changes at all levels. Yet familiarity with the Agreement area is a prerequisite of sound management decisions. Canadian Pacific believes that it can provide the continuity of experience which is, at times, missing in the Ministry force, and is prepared to take a

lead role in managing the forest and in working with Ministry staff to extend their specific knowledge of the English River Forest.

- ii) **MNR District Uniformity** - In the interest of planning consistency and efficiency, the Company suggests that the Ministry investigate the possibility of greater uniformity between Districts in the application and/or interpretation of the Timber Management Guidelines.
- iii) **Funding** - Uncertainty concerning silvicultural funding is a deterrent to good planning and management. The Company urges the Ministry to clarify its long-term commitment in this respect.
- iv) **Funding Process** - The Company suggests that the Ministry review the process and timing for obtaining FMA funding to improve the accuracy of the forecasts, to provide flexibility in distribution of funding between renewal treatments and to produce a firm allocation of funds by April 1 of the operating year.
- v) **Forecasts** - As presently required it is virtually impossible for the Company to provide accurate forecasts of silviculture and road construction programs to be included in the Annual Work Schedule by the due date of November 30. The Company suggests that the harvest schedule be presented on November 30 and those for roads and silviculture on January 1.

6. CONCLUSIONS AND RECOMMENDATIONS

The Committee is satisfied that the obligations of the Company under the Agreement have been satisfactorily performed by the Company during the five-year term under review but notes that the uncertainty of adequate funding is a growing deterrent to the continuation of the Company's aggressive style of forest management.

The Committee was impressed with the progress that has been made under the FMA in the regeneration of the jack pine sites. The Company appears to be close to achieving the goal of integrating the harvest and renewal functions.

The following are the Committee's recommendations:

RECOMMENDATION NO.1 : That the Minister extend the remaining periods of FMA 500300 by a further term of five consecutive years to March 31, 2010.

RECOMMENDATION NO.2 : That the Company review the areas operated during the 1985-90 period using the land base tracking procedures to ensure that the identification of "untreatable" and "natural regeneration" areas is correct and complete, and to make appropriate revisions to the records.

RECOMMENDATION NO.3 : That the Company review its prescription for areas to be converted from the balsam fir and hardwood working groups to jack pine and/or spruce, and particularly, the need for early release and follow-up treatments.

RECOMMENDATION NO.4 : That the Company and the Ministry ensure that in the future the approval process for the ground rules is completed by the required date.

RECOMMENDATION NO.5 : That following the submission of the Final Depletion Report for the 1985-90 period by the Company, on or before November 15, 1990, the Ministry shall complete Table C.2 - "Calculation of Area Subject to Damages" (Section 10.0 of the TMP Manual) and review the results with the Company.

RECOMMENDATION NO.6 : That the Company review its record system to ensure the necessary links between the forest resource inventory and the sequential management activities during the management period.

RECOMMENDATION NO.7 : That the Company and the Ministry review the record keeping procedure to ensure appropriate and timely information flow to the satisfaction of both parties.

RECOMMENDATION NO.8 : That annual reports include a descriptive section to report the year's highlights including an explanation of target achievements, amendments, and other significant events. In addition, that the Ministry formally acknowledge the receipt of annual reports and approvals for completeness and accuracy.

RECOMMENDATION NO.9 : That the Company, in consultation with the Ministry monitor treatments as yet unproven, (i.e. conversions of an original working group, areas left for natural regeneration, and areas of extremely difficult topography) to determine at the earliest possible time the establishment of adequate stocking, or conversely, the need for extensive treatments to promote or enhance natural regeneration. Should certain sites prove to be untreatable at reasonable cost, serious consideration should be given to excluding such areas from harvest.

RECOMMENDATION NO.10 : That the Company and the Ministry continue to explore ways and means by which to utilize the potential of the Company's GIS to satisfy the data requirements of both participants.

7. REVIEW COMMITTEE STATEMENT

We have examined the performance of Canadian Pacific Forest Products Ltd. as pertaining to its obligations under Forest Management Agreement No. 500300 (English River Forest) during the past five year-period ended March 31, 1990.

In our opinion, the Company has conformed to the rules as outlined in the Forest Management Agreement.

signed The Review Committee.

The Review Committee

SECOND FIVE-YEAR REVIEW
E.B. EDDY FOREST PRODUCTS LTD.

UPPER SPANISH FOREST
FMA 500400

LOWER SPANISH FOREST
FMA 500500

1985-1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Ministry of Natural Resources (the "Ministry") and E.B. Eddy Forest Products Ltd. (the "Company") signed two Forest Management Agreements or FMAs (the "Agreements") effective April 1, 1980. These Agreements, numbers 500400 and 500500 were designated the **UPPER SPANISH FOREST** and **LOWER SPANISH FOREST**, respectively. The purpose of these Agreements was to provide a continuous supply of forest products for the wood processing plants of the Company at Espanola and Nairn Centre and to ensure that the Upper and Lower Spanish Forests are harvested and regenerated to produce successive crops of timber on a sustained yield basis.

A review of the first five consecutive years of the Agreements was conducted on the Upper and Lower Spanish Forests in 1985. As a result of a favourable report of Company performance of its obligations under the Agreements, the Ministry extended the remaining period of the Agreements for a further term of five years, effective April 1, 1985.

The review of the second five-year period (1985-1990) of the Agreements was conducted on the Upper and Lower Spanish Forests to determine whether the obligations of the Company under the Agreements have been satisfactorily performed and to recommend to the Minister of Natural Resources whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of four (the "Committee"), engaged by the Ministry for this purpose. The four Committee members were:

- Mr. John M. Duncanson, B.Sc.F., R.P.F.,
Duncanson Investment Research Inc.,
Review Co-ordinator.
- Mr. Victor I. Sleep, B.Sc.F., R.P.F.,
Manager of Forestry Services (Retired),
Spruce Falls Power and Paper Company Ltd.,
Committee Chairman.
- Mr. Adrian M. van Fraassen, B.Sc.F.,
Manager Forest Management Planning Section, Timber Sales Branch (Retired),
Ministry of Natural Resources.
- Mr. Bernie W. Muncaster, M.Sc.,
Aquatic Biologist,
Ecological Services for Planning Ltd.

1.3 TASKS OF THE REVIEW COMMITTEE

The Committee's assignment was to undertake a fair and objective review of E.B. Eddy Forest Products Ltd. performance on the Upper and Lower Spanish Forests during the second five-year term in respect to its obligations under Forest Management Agreements 500400 and 500500 and to make recommendations to the Ministry on the extension of the Agreements' terms according to the "evergreen" section of the Agreements.

As well the Committee was requested to make conclusions and recommendations on any significant matter concerning the administration of the Agreements by the Ministry or its implementation by the Company.

The review was conducted by:

- examining the management, operating and annual plans, and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural and access road records for adequacy and for conformity with the management plans and ground rules of the Agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provisions of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects and road construction typical of the techniques employed on the forest for conformity with the Agreement holder's records and for field applications of the ground rules,
- determining the degree to which other forest users and other forest values are accommodated in management planning and in field operations,
- meeting with Company and Ministry district staff to identify problem areas and Agreement concerns on the part of either party, and,
- as specified in detail in Appendix A - "Terms of Reference for the Second Five-Year Review of a Forest Management Agreement."

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION AND SUBMISSION OF PLANS

The Agreement requires the Company to prepare management, operating plans, and annual plans as well as annual reports.

These plans and reports must be submitted to the Ministry according to the time frame specified in the Agreement and in accordance with the planning manuals approved by the Ministry for this purpose.

The Operating Plans for the Upper Spanish Forest and Lower Spanish Forest were submitted on December 4 and 5, 1984 respectively, approximately two months late. The Company notified the Ministry in advance of the submission date of the delay and the reasons for it. The Ministry accepted the delay and subsequently approved the plans within the time frame specified in the Agreement.

Annual plans and annual reports were submitted on or before the due date. The annual plans were approved by the Ministry within the time frame specified in the Agreement.

On January 1, 1986 the Ministry published a new planning manual Timber Management Planning Manual for Crown Lands in Ontario (TMP manual) which replaced the planning manual in use for the preparation of management, operating, and annual plans and annual reports for forest management agreement areas.

The format and content requirements as well as the planning process described in the new TMP manual took effect on the scheduled date, April 1, 1990. The 1990-1995 Timber Management Plan was prepared and submitted in accordance with the new TMP manual and subsequently approved within the time frame specified in the Agreement.

Similarly the 1987-1988 Annual Plan (and all annual plans and annual reports thereafter) were prepared and submitted in accordance with the new TMP manual and subsequently approved.

The new TMP manual provides for a formal process to amend the operating plan and/or annual plan when changing circumstances require the plan to be amended.

The Operating Plans for the Upper Spanish Forest and the Lower Spanish Forest have been amended sixty (60) and twelve (12) times, respectively during the 1985-90 period. The majority of the amendments involved small changes to the harvest allocation and location of roads.

Of note are two "major" amendments. In the plan for the Upper Spanish Forest an additional surplus was declared due to the under-estimate of yield per hectare in the original plan. An amendment to the plan for the Lower Spanish Forest reduced the declared surplus by allocating areas to third party operators. All amendments were approved by the Ministry.

The "planned" figures used in this review were those submitted in the original operating plan, and do not reflect the amendments made during the period 1985-90.

The amendments were difficult to "track" largely due to the fact that the figures and tables in the original operating plan were not always changed to reflect the amended changes.

The Committee also had two other concerns; i) that amended harvest allocations, which necessitated changes to renewal and maintenance operations, were not identified, and, ii) that it was not clear if

amendments to the annual plan necessitated changes to the operating plan and if so they were not identified.

RECOMMENDATION: That the Company and the Ministry include provisions for the accurate and complete recording of the changes made to the original Management Plan resulting from the amendment process, to ensure a valid basis for comparison of actual versus planned activities.

2.1.2 PLAN IMPLEMENTATION

The Agreement requires that the Company conduct its operations in accordance with the approved management, operating, and annual plans.

Silviculture operations and road construction performed by the Company in the Upper Spanish Forest and the Lower Spanish Forest, paid for by the Ministry, are summarized in Tables 1 and 1a, respectively.

In addition, the Company treated and/or retreated at its own expense during the period 1985-90 the following area:

<u>Activity</u>	<u>Upper Spanish</u>	<u>Lower Spanish</u>	<u>Total</u>
Planting	60 ha		60 ha
Seeding	603 ha	190 ha	793 ha
Tending	8 ha		8 ha
Thinning	604 ha	42 ha	646 ha
Site Preparation	19 ha		19 ha

The Committee examined the harvest, road construction, and silviculture records of the Company and found them to conform with the areas specified in the approved operating and annual plans.

The "actual" levels of harvest, regeneration, site preparation, tending and road construction compared to the 1985-90 Operating Plan are shown in Figure 1 for the Upper Spanish Forest and Figure 1a for the Lower Spanish Forest.

Explanations for the actual levels versus planned levels for harvest and road construction are given in Sections 2.3 and 2.5, respectively.

Artificial regeneration in the Upper Spanish Forest was 89% of plan, due to an over-estimate of harvest levels and the corresponding available area for treatment. In the Lower Spanish Forest the actual level of artificial regeneration was 15% higher than planned, principally due to additional area becoming available for treatment through third party operations on declared surplus area. In addition, a wild fire provided the opportunity for immediate treatment by aerial seeding.

Table 1**Summary of Company Forest Operations with Ministry Funding**

FMA Expenditure and
Accomplishment Report
For The Five-Year Period
1985 - 1990

FMA 500400
Upper Spanish Forest
E.B. Eddy Forest Products Ltd.

	AREA (hectares)	COST (dollars)
Harvest	23,118	
Natural Regeneration	349	
Artificial Regeneration		
- Planting Bareroot	1,214	
- Planting Container	6,529	
- Seeding Direct	3,030	
Total Regeneration	11,122	
Retreatment	129	
Site Preparation		
- Mechanical	11,662	
- Chemical	1,507	
- Prescribed Burning	946	
Total Site Preparation	14,115	
Tending		
- Chemical Cleaning	8,342	
- Manual Cleaning	71	
- Thinning	157	
Total Tending	8,570	
TOTAL SILVICULTURAL PAYMENTS		\$ 6,484,808
	(kilometres)	
Road Construction		
- Primary	39.7	
- Secondary	190.5	
Total Road Construction	230.2	
Road Maintenance	674.4	
TOTAL ROAD PAYMENTS		\$ 4,094,889
TOTAL PAYMENTS		\$ 10,579,697

Table 1a

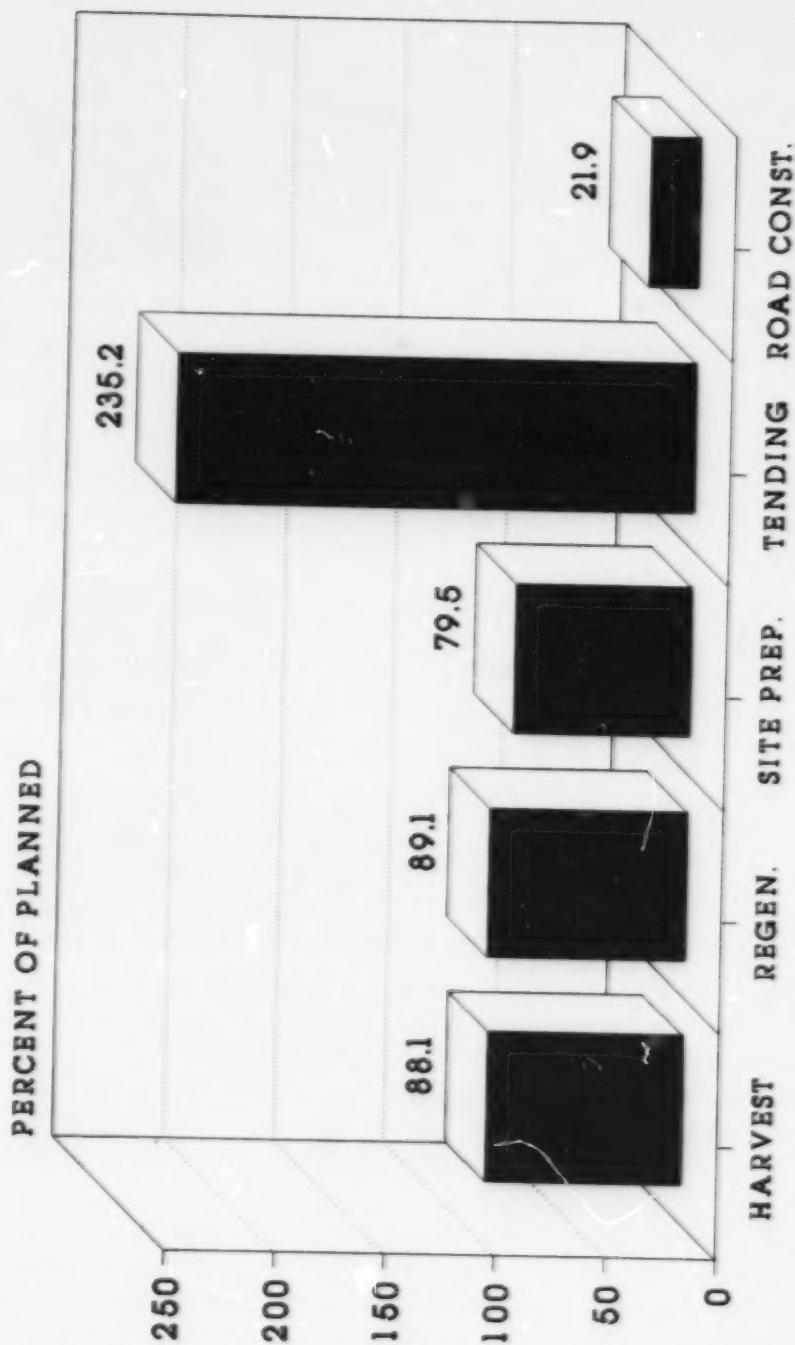
Summary of Company Forest Operations with Ministry Funding

FMA Expenditure and
Accomplishment Report
For The Five-Year Period
1985 - 1990

FMA 500500
Lower Spanish Forest
E.B. Eddy Forest Products Ltd.

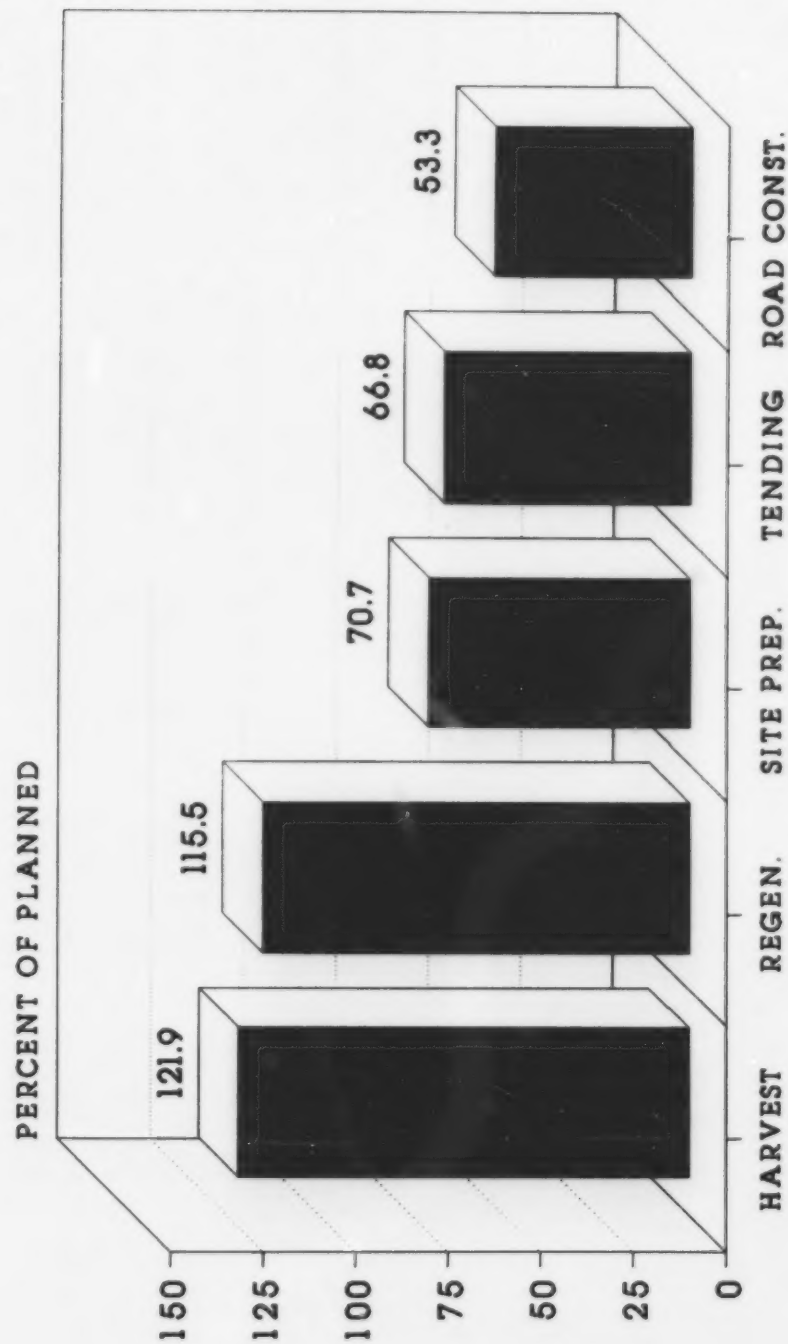
		AREA (hectares)	COST (dollars)
Harvest		21,544	
Natural Regeneration		453	
Artificial Regeneration	- Planting Bareroot	511	
	- Planting Container	4,951	
	- Seeding Direct	3,361	
Total Regeneration		9,276	
Retreatment		20	
Site Preparation	- Mechanical	8,142	
	- Chemical	237	
	- Prescribed Burning	403	
Total Site Preparation		8,782	
Tending	- Chemical Cleaning	877	
	- Manual Cleaning	0	
	- Thinning	0	
Total Tending		877	
TOTAL SILVICULTURAL PAYMENTS			\$ 4,342,091
		(kilometres)	
Road Construction	- Primary	24.7	
	- Secondary	304.1	
Total Road Construction		329.3	
Road Maintenance		1,206.8	
TOTAL ROAD PAYMENTS			\$ 5,129,050
TOTAL PAYMENTS			\$ 9,471,141

**FIGURE 1: COMPARISON OF 1985-1990
OPERATING PLAN VS. ACTUAL
FMA 500400 UPPER SPANISH FOREST**



Source: Annual Reports,
1985-90 Operating Plan.

**FIGURE 1a: COMPARISON OF 1985-90
OPERATING PLAN VS. ACTUAL
FMA 500500 LOWER SPANISH FOREST**



Source: Annual Reports,
1985-90 Operating Plan.

Site preparation levels were 80% and 70% of plan in the Upper Spanish Forest and Lower Spanish Forest, respectively. In both forests an over-estimate of available cutover area contributed to the shortfall. In addition, a planned prescribed burn in the Lower Spanish Forest was never completed.

Tending levels in the Upper Spanish Forest were 135% in excess of planned levels while in the Lower Spanish Forest a shortfall of 33% occurred. The major reason for the wide discrepancies between plan and actual levels is the difficulty in forecasting whether or not treatment will be necessary five years in advance. In the Upper Spanish Forest, the competition proved to be heavier and more extensive than had been expected. In some cases a second treatment was required. Areas totalling 1,500 hectares of Ministry plantations requiring release were added to the Company's program. In the Lower Spanish Forest, the total area requiring release proved to be less than expected.

2.2 THE GROUND RULES

2.2.1. KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

Based on discussions held with the Company, both in the office and in the field, it was apparent that the Company staff were knowledgeable and familiar with the provisions of the ground rules and the Agreement. However, there appeared to be some confusion with respect to reporting:

- a) areas of "Modified Harvest Cutting".
- b) determination of site preparation area for purposes of invoicing for payment versus silvicultural records, i.e. that the GROSS area be used for the silvicultural record and NET area be used in the invoice for payment.
- c) the identification of cut-over areas having a high potential for natural regeneration as a component of reported renewal.
- d) areas classified as "untreatable".

The 1990-95 ground rules include a new strategy for tracking "natural regeneration" and untreatable areas. The Company has also revised the method of determining "areas of modified harvest cutting". The Committee supports the use of "gross area" of site preparation as the more practical alternative for the silvicultural records. It would be advisable to review these procedures to ensure that existing report forms, tables, and data sheets will accommodate the revised data. The need and practicality of revising the 1985-90 reports and records should be considered.

RECOMMENDATION: That the Company and the Ministry jointly review the reporting procedures with respect to the following activities: modified harvest cutting, determination of site preparation areas for purposes of invoicing, identification of cut-over areas having a high potential for natural regeneration, and areas classified as "untreatable", to ensure that the existing forms, tables, and data sheets used in reporting and recording the information are compatible with the revised procedures and will readily provide the reports and summaries required for future FMA reviews.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

The Committee's examination of silvicultural records, its field inspections, and its discussions with Ministry staff all confirmed that harvesting and silvicultural operations have been conducted in accordance with the ground rules.

The ground rules permit the classification of non-treatable sites by mutual agreement. An area may be classed as non-treatable where extremes in topography, shallowness of soil, excessive rock, poor drainage or inaccessibility make it uneconomic or impractical to treat. Non-treatable areas either allocated for harvesting in the operating plan or depleted for other reasons during the operating plan period were to be included in the depletion section of the annual report.

During this review period in the Upper and Lower Spanish Forests non-treatable areas smaller than 8 hectares (ha) were included as part of the surrounding treatment thus forming part of the new production forest. A total of 325 ha of non-treatable areas larger than 8 ha were recorded.

When the Company operates on more difficult sites, for example, where residual trees and/or rugged terrain make cost effective treatment difficult, the Company prescription has usually been "harvest cut followed by natural regeneration without treatment." Because it is too early to determine if such prescriptions will be successful in terms of minimal stocking of the desired species, the Company has been reluctant to classify the areas and include them in the annual reports. The Committee is concerned that the annual reports for the 1985-90 period understate the area that will regenerate naturally and probably understate the untreatable area.

As was noted earlier the Company and the Ministry have recognized the problem of tracking natural regeneration and have included in the 1990-95 ground rules a strategy by which the harvested area will be subdivided into two treatment classifications; Intensive Regeneration Prescription and Extensive Regeneration Prescription. All areas will be monitored and assessed at appropriate intervals until they can be reclassified as "Free-To-Grow" (FTG) or alternatively as "untreatable". Actual treatments for both the intensive and extensive programs will be reported each year in the annual report. This process together with improved reporting procedures as recommended under 2.2.1 above should improve the future accuracy and usefulness of the land base inventory.

The Committee was provided the opportunity to visit and inspect selected operations on the ground and to gain an overview from the air in both the Upper and Lower Spanish Forests.

The Committee is of the opinion that where the Company practices intensive silviculture, primarily in the jack pine working group and other working groups where jack pine forms a significant proportion, such practices are very successful. The Committee was impressed with the many examples of successful site preparation, planting, seeding, and thinning projects.

The success is primarily the result of a committed and dedicated forestry staff in both the planning and the implementation stages. There is no question that the integration of harvest and renewal, one of the primary goals of the FMA undertaking, has been achieved.

In the Lower Spanish Forest, the Committee observed certain harvested areas where the original stand included scattered white and/or red pine. The renewal prescription specified a diameter limit of 16 inches for white and 12 inches for red pine and resulted in scattered red and white pine trees smaller than 16 inches being left as seed trees. Many of these trees had been damaged during skidding. Although the prescription for the regeneration of white and red pine is included in Table I of the ground rules, the Company staff has limited experience with its application and is uncertain of its success.

RECOMMENDATION: That the Company continue to seek the advice of experts in white and red pine renewal in refining the present prescription with respect to numbers and spacing of seed trees, site preparation techniques, and the need to tailor these parameters to suit specific site conditions and species composition.

The Committee noted that, particularly in the case of full tree logging, a heavy mat of limbs and tops is left at roadside on the skidway sites. Where the yield of timber is high this mat is almost continuous. In some instances, an attempt was made to consolidate this slash into piles suitable for burning. Even where burning had not been achieved due to climatic constraints, a substantial area of cutover was made ready for renewal by natural or artificial means. Areas made available for regeneration using these techniques are included and paid for as site preparation. The Committee suggests that the Company apply this option wherever possible.

RECOMMENDATION: That the Company continue the practice of consolidating (ramping) and burning roadside slash to the maximum possible extent.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

The invoicing procedures were found to be in conformity with those specified in the ground rules. The Company reconciled any differences in hectares treated, number of trees planted or kilometres of roads constructed or maintained before invoices were submitted and subsequently approved.

2.2.4 PREPARATION OF NEW GROUND RULES

The Agreement requires both the Company and the Ministry to commence preparation of new ground rules for the next five-year term at least eight months prior to the expiry of the old ground rules, and to agree upon the new ground rules on or before the expiry date of March 31, 1990.

The preparation of the new ground rules commenced on time and approval in principle was given on June 15, 1990. The following recommendation is a repetition of the one submitted in the previous Five-Year Review.

RECOMMENDATION: That the Company and the Ministry ensure that in future the ground rule approval process is completed by the required date.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS AND WOOD FLOW

According to paragraph 20(1) of the Agreement, the Company has agreed to maintain its harvest on the Upper and Lower Spanish Forests at a level between 90% and 110% of the calculated allowable depletion (allowable cut) for each working group. The Company may request the Ministry to authorize variations to the levels specified in the Agreement.

Paragraphs 20(3) and 20(4) of the Agreement provide for either a remedy or liquidated damages in the event of an overcut or undercut, respectively, on the agreement area. The Agreement holder may avoid liquidated damages through the declaration of timber surplus to its needs in an approved management plan (paragraph 20(6)).

Under the terms of the TMP manual, the Annual Depletion Report must be submitted by November 15 of the year following the harvest. The Depletion Report referred to for the purposes of this review is a preliminary one. Major changes are not anticipated in the final report. Therefore the conclusions and comparisons which have been derived by the Committee are expected to remain valid. The "Calculation of Area Subject to Damages for Overcutting or Undercutting" (Table C.2, p 210 of the TMP manual) cannot be completed for this audit until the Final Depletion Report for 1989-90 is submitted on November 15, 1990.

RECOMMENDATION: That following the submission of a Final Depletion Report for the 1985-90 period by the Company, on or before November 15, 1990, the Ministry shall complete Table C.2 - "Calculation of Area Subject to Damages" (Section 10.0 of the TMP Manual) for both the Upper and Lower Spanish Forests, and review the results with the Company.

In the case of the Upper Spanish Forest, major amendments to the 1985-90 Operating Plan submitted by the Company in 1987 and 1988, and subsequently approved by the Ministry, resulted in an increase of the declared surplus. For the (declared) surplus areas, markets could not be found for poplar or birch. Only 3.5% of the surplus jack pine and 2.1% of the surplus spruce was harvested by third parties. Figure 2 shows a comparison of the actual harvest for the five-year term with the allowable depletion for all working groups combined. Actual conifer yields per hectare were 16% higher than predicted. Yields predicted for the 1990-95 period forecast a reduction of 21% from the actual 1985-90 levels. The apparent discrepancy between these two figures illustrates the inconsistency of previous yield predictions. The Company has adopted a new strategy for volume estimates which includes increased operational cruising, updating of local volume tables and refinement of the adjustment factors which are applied to Forest Resource Inventory (FRI) volumes. These measures are expected to improve the precision of the allocations for the 1990-95 plan and result in fewer amendments.

In the case of the Lower Spanish Forest, amendments to the 1985-90 Operating Plan were approved to provide for third party operations within areas declared surplus by the Company. The actual harvest for third parties was less than provided for in the amended plan. For the (declared) surplus areas, markets developed which enabled 49% of the conifer surplus and 9% of the hardwood surplus to be harvested. Figure 2a shows a comparison of the actual cut for the five-year term with the allowable depletion for all working groups combined. Actual conifer yields per hectare were very close to the predicted yields. Yields predicted for the 1990-95 period forecast a reduction of 12% from the 1985-90 actual.

A total of ten companies operated on the Upper and Lower Spanish Forests under the authority of Third Party Agreements and Third Party Licences. A number of District Cutting Licences produced small amounts of various species. The total volume harvested under these arrangements is detailed by species in the following table;

<u>SPECIES</u>	<u>VOLUME (m³)</u>
Jack Pine	203,963
Spruce	123,893
White Pine	198,460
Red Pine	174,986
Poplar	59,644
Birch	8,920
Other Hardwoods	<u>21,223</u>
TOTAL	791,089

(source: Table 4.3.1 - Report of Wood Utilization by Licensee)

The Committee encourages the Company and the Ministry to continue their attempts to promote a more complete utilization within the two FMAs.

2.4 NSR OBLIGATIONS

All but 60 hectares of the Company obligations were treated during the first five-year term. Correspondence on file confirms that 100% of the original NSR obligation has now been fulfilled.

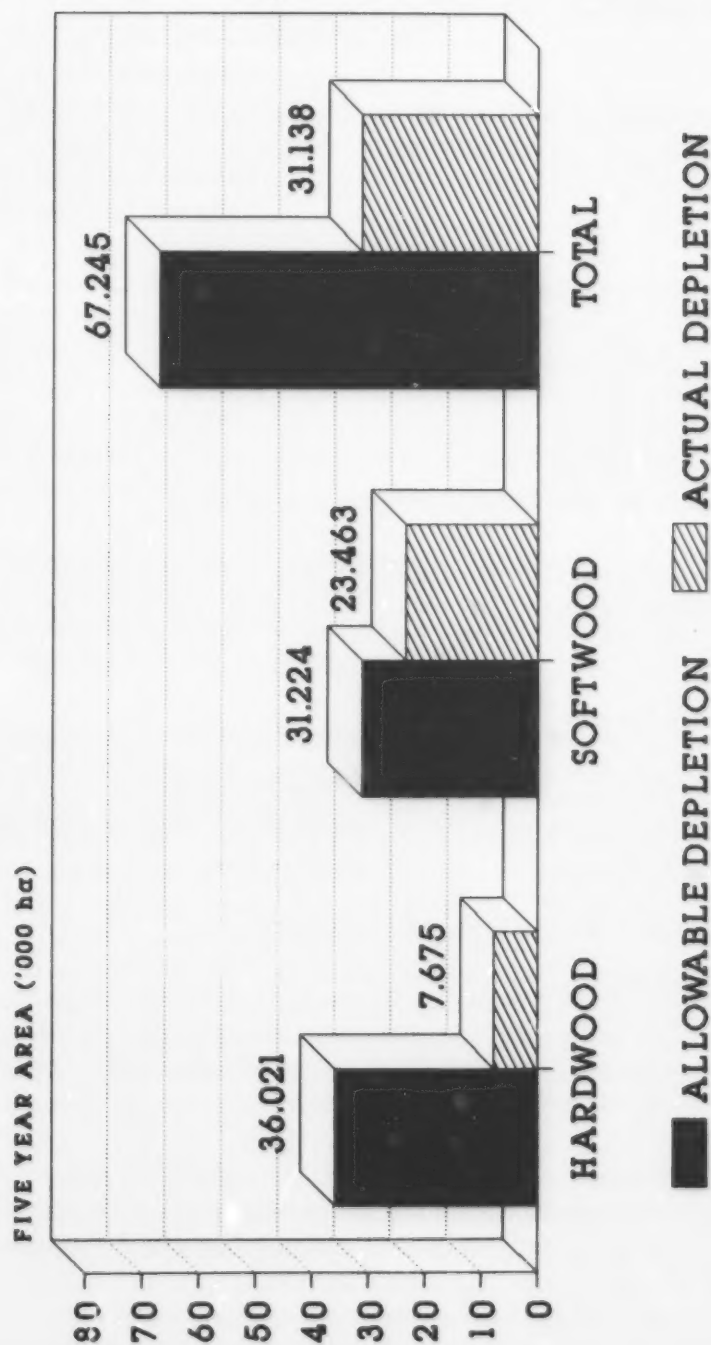
2.5 ROAD CONSTRUCTION AND MAINTENANCE

Paragraph 31 of the Agreement provides for the Ministry to pay (subject to a maximum per kilometre) for the construction or the reconstruction of forest access roads on the Agreement area. To be eligible for payment, roads must be detailed in an approved Annual Plan and constructed according to "Schedule E" of the Agreement.

In the Upper and Lower Spanish Forests, roads were constructed by the Company and inspected jointly by a Company representative and a Ministry representative. No roads were found to be substandard for the 1985-90 period. The access road networks in both the Upper and Lower Spanish Forests were well developed.

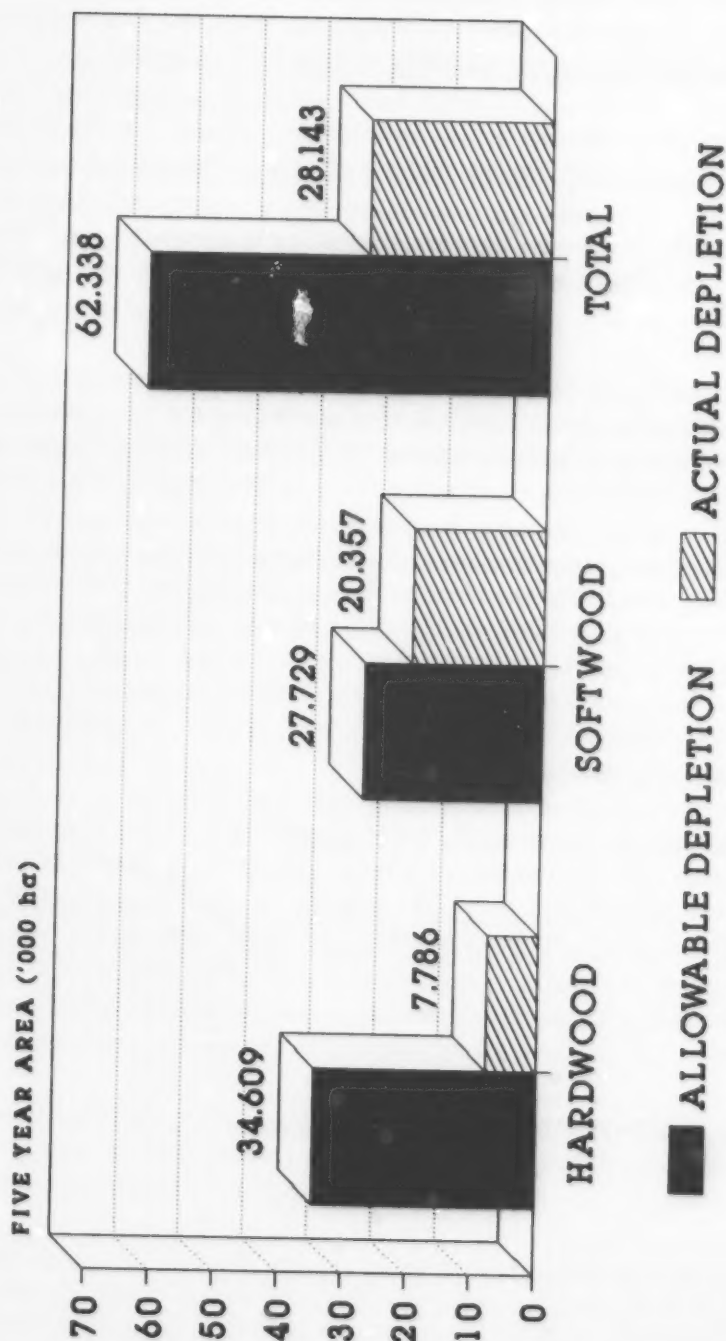
The terrain covered by the Upper Spanish Forest is generally flat with relatively few obstacles to road construction. The terrain in the Lower Spanish Forest is much more rugged with greater slopes, less soil and large boulders.

FIGURE 2: COMPARISON OF 1985-1990
ALLOWABLE VS. ACTUAL DEPLETION
FMA 500400 UPPER SPANISH FOREST



Note:
Allow Depl=Plan Harvest & Surplus
Act Depl=Act Harvest & Non-Harvest Depl

**FIGURE 2a: COMPARISON OF 1985-1990
ALLOWABLE VS. ACTUAL DEPLETION
FMA 500500 LOWER SPANISH FOREST**



Note:
 Allow Depl=Plan Harvest & Surplus
 Act Depl=Act Harvest & Non-Harvest Depl

A total of 230.2 km and 329.3 km of road construction or reconstruction was funded by the FMA in the Upper and Lower Spanish Forests during the 1985-90 period (Tables 1 and 1a). This represented 22% and 53% of the planned roads in the Upper and Lower Spanish Forest, respectively (Figures 1 and 1a). This shortfall was due to a decline in harvest, a decline in funding which resulted in some roads constructed to a lower standard and rough terrain which made predicting the secondary road requirements difficult. A carry-over effect was likely present from the 1980-85 period in which roads were constructed to access areas not harvested until the 1985-90 period.

The road network provided sufficient access for third party operators. As will be discussed in Section 2.8, the Company has accommodated concerns of other users regarding new access.

Reporting of a road after partial pavement and gravelling ("to complete") resulted in double counting in some cases. This problem was rectified in the 1987 Annual Report, with no double counting occurring after 1986.

Concern was expressed by Ministry officials regarding primary and secondary roads built in the 1980-85 period to access overmature jack pine in Dunbar Township. The 1985-90 harvest in this area was terminated prematurely due to excess cull resulting in under-utilization of the roads.

In the Lower Spanish Forest, planned and actual road maintenance for the 1985-90 period were very similar while the actual road maintenance represented only 55% of the planned amount in the Upper Spanish Forest. This reduction was a result of fewer roads built than planned in the Upper Spanish Forest and decreased funding. While road funding by the Ministry was reduced, the Company continued to maintain roads at their own expense.

2.6 COMPANY RECORDS

The Company maintains a comprehensive set of depletion, silviculture and road records. The Company uses computer stand listings to link to the FRI and computer project listings to link treatments, stocking assessments, and FTG assessments. The computer listings generate the annual reports required by the Agreement and additional summary reports when required.

The records include sets of colour-coded township maps identifying depletion, silviculture treatments and assessments.

The Committee was impressed by this record keeping system.

2.7 ANNUAL REPORTS

The Agreement requires the Agreement holder to prepare and submit an annual report in accordance with requirements and within the time frames as set out in the planning manuals approved by the Ministry.

All annual reports were submitted on time and approved by the Designated Crown Representative (DCR) for completeness and accuracy.

The Committee has used these annual reports as the source data for this review and found no errors or omissions. A commendable job of annual reporting has been maintained.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 15 of "Schedule C" (the Ground Rules) in the Agreement, entitled Modified Management Areas (MMAs), details areas which are to be managed to meet objectives other than or in addition to wood fibre production. These areas were to be identified during the preparation of the five-year operating plan. The Ministry, Company and others may identify the values to be protected.

Access roads on the Upper and Lower Spanish Forests have provided considerably improved access to the forest for other users. The Company has worked with remote tourist operators on an individual basis to attempt to accommodate concerns associated with new access. Examples of the Company's efforts include: seasonal restrictions on harvesting, use of temporary winter roads, and rerouting of roads. A viewshed reserve to maintain visual integrity along the Mississagi River Waterway Provincial Park has been included in the 1990-95 Timber Management Plan.

The Company took the initiative to develop a co-operative system with mining companies to relocate claim posts. This reduces search time for both parties.

Fish and wildlife interests have been accommodated in a satisfactory manner by the Company. In two examples, the Company placed their own reserves on creeks that had been overlooked in the approvals process. A heronry was located in Cunningham Township with a 1 km "no operation" seasonal restriction in place. The Company has implemented a policy to protect previously unidentified areas of environmental concern as encountered in the field.

There was good co-operation between the Company and the Ministry in implementing the moose habitat guidelines for the 1990-95 TMP. Ministry personnel indicated that direct dealings with Company field and office staff were the most beneficial.

Water crossings were handled very well with culverts generally well placed, of sufficient diameter and length, and stream banks stabilized. Stream crossings were observed from the air and on the ground. Rip/rap and geotextile liner were used as required by the Ministry. Rights-of-way were kept to a minimum width as roads approached stream crossings. The original stream courses were generally not affected and the Company has gone to great lengths on several occasions to minimize

disturbance to shoreline vegetation. Other examples of Company initiative to minimize the effect of water crossings, include the use of boulders to reduce potential erosion from cribs and roadside banks between culverts, rerouting of roads to decrease the number of stream crossings, and straw bales and seeded grass to reduce sedimentation carried along roadside banks.

Culverts were used throughout the Company's road network. In general culverts were well maintained. However, erosion was observed at some older culverts which lacked rip/rap and buckling was observed at two culverts. Culverts were lacking on some third party roads, which resulted in significant ponding which could lead to road damage.

RECOMMENDATION: That the Company and the Ministry ensure that all Company and Third Party roads are designed to the proper standards and monitored after construction so that problems such as ponding of waterways, erosion, etc. can be promptly detected and corrected.

3. MAINTENANCE OF PRODUCTIVITY

Tables 2 and 2a show the maximum allowable depletion (MAD) which was calculated for the two FMAs at the beginning of the 1985-90 term. Harvesting and other forest depletions in both FMAs were well within the obligations of the Agreements for all working groups. Regeneration treatment was applied to an area equivalent to 48% of the harvested area of the Upper Spanish Forest. For the Lower Spanish Forest the corresponding figure was 41%. In both cases large areas have been designated with the expectation that natural regeneration will produce adequate stocking. Company staff were reluctant to identify natural regeneration areas until the fifth-year stocking assessments had been prepared. Consequently, many of these areas have not been included in the tables. The percent regenerated would have been greater had areas of natural regeneration been included as "regenerated area". The implementation of the "land base tracking procedure" should solve this problem.

Figures 3 and 3a present a comparison of areas regenerated to areas of harvest cut. The area planted or seeded by artificial treatments during the first ten years of the FMAs was equivalent to 60% and 30% respectively, of the areas harvested on the Upper and Lower Spanish Forests. These percentages increase to 74% and 42% respectively, when the reported natural regeneration is included.

It should also be understood that where artificial regeneration is prescribed there is a two-year delay between harvest and renewal during which the timber is removed to the manufacturing plant and the area is prepared for planting by site preparation. When consideration is given to this two-year lag, the

TABLE 2

Depletion of Agreement Area for 1985 - 1990
(hectares)

FMA 500400
Upper Spanish Forest
E.B. Eddy Forest Products Ltd.

Working Group	Maximum Allowable Depletion	Declared Surplus	Planned Harvest	Actual Harvest	Actual Depletion	Difference Plan - Act Harvest
Spruce	13,862	4,709	7,701	7,846	8,580	-145
Fir	-	-	268	878	1,073	-610
Jack Pine	17,717	4,276	14,248	12,551	13,505	+1,697
Other Conifer	-	-	-	197	218	-197
Red/White Pine	-	-	22	58	87	-36
Poplar	24,702	19,594	3,278	5,120	5,689	-1,842
Birch	14,415	12,404	735	1,705	1,859	-970
Other Hardwood	-	-	10	127	127	-117
TOTAL	70,696	40,983	26,262	28,482	31,138	-2,220

- (1) Planned Harvest = Planned Depletion - Planned Reserves
 (2) Actual Harvest = Actual Cut + Bypass
 (3) Actual Depletion = Actual Harvest + Reserves + Non-Harvest Depletion

Note: Figures represent 4 years actual data and final year estimated data

Source: Table 4.1 Report of Depletion by Area 1985 - 90

accomplishment in terms of "percentage of available land given renewal treatment" is as follows (area in hectares):

	Upper Spanish	Lower Spanish	Total
AVAILABLE for RENEWAL*	16,326	11,373	27,699
TOTAL REGENERATION	11,122	9,276	20,398
PERCENT of AVAILABLE AREA	68%	82%	74%

* area available for renewal is equal to total 1983-88 harvest

During the 1985-90 term of the Agreement fifth-year stocking assessments were conducted in accordance with the ground rules. No "failed" areas requiring treatment were identified. Subsequently, the Company found and retreated at its own expense a 32 hectare area which had only marginally acceptable stocking. A total of 18,896 hectares of NSR and regenerated cut-over lands were approved as Free-to-Grow and added to the 1 - 20 year age class of the forest inventory.

TABLE 2a

Depletion of Agreement Area for 1985 - 1990
(hectares)

FMA 500500

Lower Spanish Forest

E.B. Eddy Forest Products Ltd.

Working Group	Maximum Allowable Depletion	Declared Surplus	Planned Harvest	Actual Harvest	Actual Depletion	Difference Plan - Act Harvest
Spruce	6,302	3,084	1,336	3,218	3,689	-1,882
Fir	-	-	83	182	286	-99
Jack Pine	21,125	7,918	11,430	12,156	13,472	-726
Other Conifer	-	-	20	79	79	-59
Red/White Pine	4,023	2,252	1,606	2,578	2,831	-972
Poplar	20,955	17,212	2,309	4,632	5,233	-2,323
Birch	15,212	13,166	892	1,936	2,491	-1,044
Other Hardwood	1,056	1,030	-	62	62	-62
TOTAL	68,673	44,662	17,676	24,843	28,143	-7,167

(1) Planned Harvest = Planned Depletion - Planned Reserves

(2) Actual Harvest = Actual Cut + Bypass

(3) Actual Depletion = Actual Harvest + Reserves + Non-Harvest Depletion

Note: Figures represent 4 years actual data and final year estimated data

Source: Table 4.1 Report of Depletion by Area 1985 - 90

Successful examples of natural regeneration were observed in the field and tracts of similar potential sites were identified in areas of recent cut-over which will not be artificially treated. Future assessments are expected to reveal that the total renewal (artificial plus natural) has maintained the productivity of the timber production land base.

Many sites, particularly in the Lower Spanish Forest, are extremely rocky with steep slopes and shallow soils, conditions which would make all operations difficult and expensive. In its efforts to maintain jack pine productivity, the Company is pressing current technology to the limit. Where conditions render traditional treatments impractical they are experimenting with lower cost, extensive renewal techniques aimed at promoting or enhancing natural regeneration.

To further address long-term productivity the Company has expanded its staff of professional foresters to include one additional management forester, two assistant operating foresters and a designated silviculturist whose responsibilities encompass tree improvement, stock production, private land forestry, thinning/spacing research and innovative silviculture trials. Active programs are in progress in each of these specialities. The Company was the first FMA holder to enter into direct

FIGURE 3: 1980-90
HARVEST AND REGENERATION
FMA 500400 UPPER SPANISH FOREST

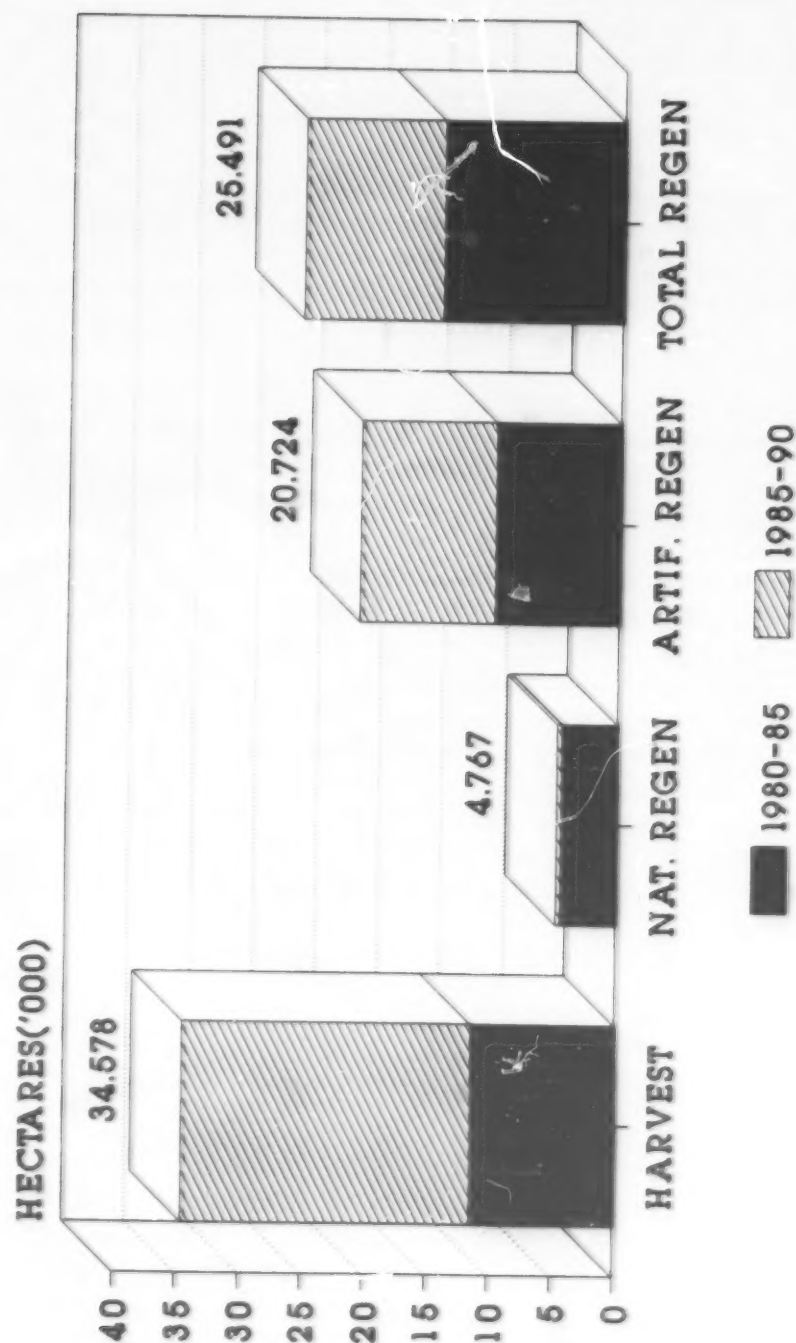
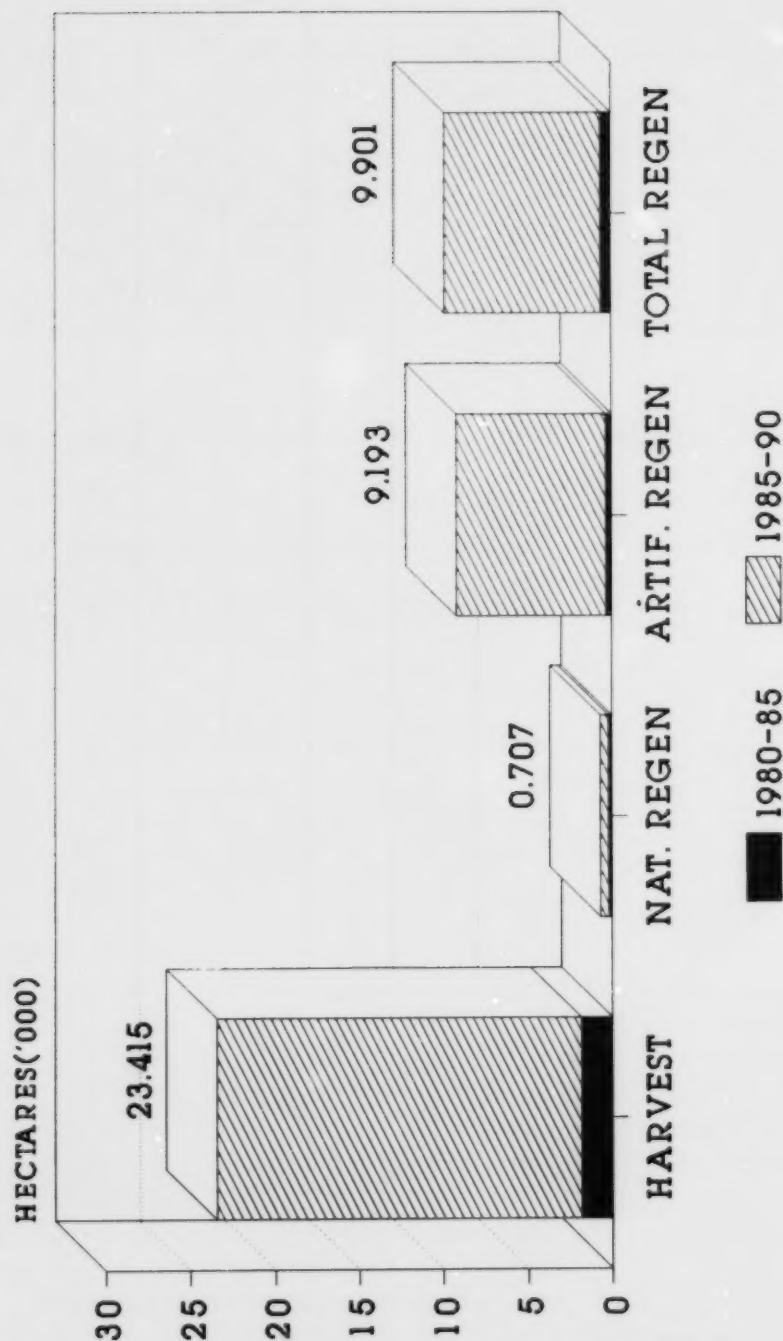


FIGURE 3a: 1980-1990
HARVEST AND REGENERATION
FMA 500500 LOWER SPANISH FOREST



purchase of nursery stock which gives the Company direct control of stock specifications and deliveries.

The Committee believes that the Company's current practice with respect to management of the land base, its renewal program and the application of intensive management techniques will increase the merchantable volume of timber per hectare of land being managed. The land base itself continues to shrink as land is withdrawn from timber production to provide for other uses and protect other values. Future total productivity of the Agreement forests will depend on the amount of land which remains dedicated to timber production.

RECOMMENDATION: That the Company, in consultation with the Ministry, monitor treatments as yet unproven, (i.e. conversions of an original working group, white and red pine seed tree projects, areas left for natural regeneration, and areas of extremely difficult topography) to determine at the earliest possible time the establishment of adequate stocking or, conversely, the need for extensive treatments to promote or enhance natural regeneration.

The reality of a land base which is capable of producing a variety of timber products, some of which are surplus to the current needs of the Company, presents a challenge and an opportunity. The Committee encourages the Company and the Ministry to continue their attempts to achieve a more complete utilization within the two FMAs.

RECOMMENDATION: That the Company formulate a long-term wood supply strategy for the Upper and Lower Spanish Forests to be included in the 1995 - 2000 Timber Management Plan.

The Committee was impressed with the Forestry Division organization and silvicultural practices of the Company and commend the Company for those activities and for their initiatives in treating some areas and conducting research and development projects at their own expense. In this respect, during the 1985-90 period the Company located over 2,000 "plus trees" and collected cones from approximately 1,600 of them. Seed production areas totalling 136 ha were established and maintained and the Company maintained 13 ha of seed orchards previously established by the Ministry. Family tests of "plus tree" stock created 12 ha of planted area.

4. **IMPLEMENTATION OF THE RECOMMENDATIONS OF THE FIRST FIVE-YEAR REVIEW**

The recommendations resulting from the first five-year review of operations of the Company in the Upper and Lower Spanish Forests and the status of their implementation are as follows:

That the two Agreements with E.B. Eddy Forest Products Ltd. be extended for a further term of five years.

The Agreements were extended by the Minister.

That the Company undertake more research and development in the pursuit of minimizing the risks in the aerial seeding of jack pine. Past research should be reviewed and trials should be continued addressing such factors as site, application rates and timing.

That the Company undertake research for the optimum chemical for controlling the weeds of these forests, time of application, rates, etc. while minimizing the adverse effect on jack pine.

That the Company be fully apprised and involved in all aspects of the current jackpine Budworm attack---from survey methods and results to public involvement.

That all Ministry records of Ministry silvicultural work on both forests be reconciled by the districts and transferred to the Company, including the status of NSR areas which the Ministry has treated. FTG assessments on MNR treated areas should be accelerated by MNR and the resultant information included in the Maximum Allowable Depletion calculations.

That the Ministry remove itself from maintaining duplicate project records and only retain summaries of work accomplished to substantiate payments.

All of the above recommendations have been implemented.

That the Ministry and Company should resolve the issue of payment for removing or gating roads to enhance or protect resources, which may occur, for the benefit of other forest users.

That the Ministry should consider the presence of one Designated Crown Representative to administer Ministry involvement on both Agreement areas.

No changes have been instituted and it is assumed that the problems which prompted these two recommendations still exist.

5. COMPANY CONCERNS

The Company expressed concerns with:

- i) **Funding** - Road funding has been drastically reduced and appears destined to disappear completely. Silviculture funding has increased substantially but total funding has fallen during the 1985-90 term. The Upper Spanish Forest program was short-funded in 1989 and funding for the Lower Spanish Forest for 1990 is yet to be confirmed.

As late as June 14, 1990 allocations of road and silviculture funding were still tentative. The logistics of planning a program, leasing equipment and/or contracting the work are adversely affected by late funding notification and subsequent cutbacks. The Company would like greater freedom to transfer funds between their two FMAs where surpluses or deficits exist. The announcement of the current year inflation factor to be used to adjust FMA funding rates is not made until mid-summer. Consequently many invoices must be reworked to incorporate that number. This produces extra work for both the Company and the Ministry.

ii) Forest Protection - Over the past several years there has been a considerable downsizing of the Ministry's fire suppression crews both at the district and regional levels. The Company is concerned that the Ministry may be unable to provide enough trained crews to protect the forests in the event of a severe fire situation.

iii) Agreement Extension - The Company is concerned about the long delay between the fifth year audits and the extension of the Agreement for a further five-year term.

iv) Revised Timber Production Policy - The Company believes there is an urgent need for a revised timber production policy formulated jointly by the forest industry and the Ministry. This policy would identify anticipated future wood supply requirements for the Province and the appropriate regeneration and funding levels necessary to meet these wood supply needs.

The timber production policy should set production targets provincially and by "woodshed" and management unit. These targets would then be used to help secure government funding commitments. Until such a policy is formulated and implemented, the questions of how much regeneration is sufficient and how much should be spent on regeneration cannot be adequately answered. A new timber production policy is absolutely essential to assist in obtaining an adequate level of funding for forest renewal on all management units (both Crown and FMA).

The Company believes that a new Ontario timber production policy is essential in determining an adequate level of funding for forest renewal and suggests that the Ministry and the forest industry jointly formulate a revised policy as soon as possible.

6. CONCLUSIONS AND RECOMMENDATIONS

The Committee is satisfied that the obligations of the Company under the Agreement have been satisfactorily performed by the Company during the five-year term under review but notes that the uncertainty of adequate funding is a growing deterrent to the continuation of the Company's aggressive and innovative style of forest management.

The commitment of the Company in addressing the interests of other users and potential environmental impacts is commendable.

The Committee was impressed with the progress made during the second five-year term of the FMA in the regeneration of difficult sites as well as the prime jack pine sites which already present an aura of success in the regenerated areas. The revised organization to manage the FMA has achieved the integration of harvest and renewal that was hoped for in the creation of the FMAs. Field and office staff display an intimate knowledge of the forests they manage and the commitment, experience and ability that is needed to carry out that responsibility.

The following are the Committee's recommendations:

RECOMMENDATION NO.1 : That the Minister extend the remaining periods of FMAs 500400 and 500500 by a further term of five consecutive years to March 31, 2010.

RECOMMENDATION NO.2 : That the Company and the Ministry include provisions for the accurate and complete recording of the changes made to the original Management Plan resulting from the amendment process, to ensure a valid basis for comparison of actual versus planned activities.

RECOMMENDATION NO.3 : That the Company and the Ministry jointly review the reporting procedures with respect to the following activities; modified harvest cutting, determination of site preparation areas for purposes of invoicing, identification of cut-over areas having a high potential for natural regeneration, and areas classified as "untreatable", to ensure that the existing forms, tables, and data sheets used in reporting and recording the information are compatible with the revised procedures and will readily provide the reports and summaries required for future FMA reviews.

RECOMMENDATION NO.4 : That the Company continue to seek the advice of experts in white and red pine renewal in refining the present prescription with respect to numbers and spacing of seed trees, site preparation techniques, and the need to tailor these parameters to suit specific site conditions and species composition.

RECOMMENDATION NO.5 : That the Company continue the practice of ramping and burning roadside slash to the maximum possible extent.

RECOMMENDATION NO.6 : That the Company and the Ministry ensure that in future, the ground rule approval process is completed by the required date.

RECOMMENDATION NO.7 : That following the submission of a Final Depletion Report for the 1985-90 period by the Company, on or before November 15, 1990, the Ministry shall complete Table C.2 - "Calculation of Area Subject to Damages" (Section 10.0 of the TMP Manual) for both the Upper and Lower Spanish Forests, and review the results with the Company.

RECOMMENDATION NO.8 : That the Company and the Ministry ensure that all Company and Third Party roads are designed to the proper standards and monitored after construction so that problems such as ponding of waterways, erosion, etc. can be promptly detected and corrected.

RECOMMENDATION NO.9 : That the Company in consultation with the Ministry monitor treatments as yet unproven, (i.e. conversions of an original working group, white and red pine seed tree projects, areas left for natural regeneration, and areas of extremely difficult topography) to determine at the earliest possible time the establishment of adequate stocking or, conversely, the need for extensive treatments to promote or enhance natural regeneration.

RECOMMENDATION NO.10 : That the Company formulate a long-term wood supply strategy for the Upper and Lower Spanish Forests to be included in the 1995 - 2000 Timber Management Plan.

7. REVIEW COMMITTEE STATEMENT

We have examined the performance of E.B. Eddy Forest Products Ltd. as pertaining to its obligations under Forest Management Agreements No. 500400 (Upper Spanish Forest) and 500500 (Lower Spanish Forest) during the past five-year period ended March 31, 1990.

In our opinion, the Company has conformed to the rules as outlined in the Forest Management Agreement.

signed The Review Committee

The Review Committee



SECOND FIVE-YEAR REVIEW
SPRUCE FALLS POWER AND PAPER COMPANY LTD.

GORDON COSENS FOREST
FMA 500600

1985-1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Ministry of Natural Resources (the "Ministry") and Spruce Falls Power and Paper Company Ltd. (the "Company") signed a Forest Management Agreement or FMA (the "Agreement") on September 19, 1980. This Agreement, number 500600, was designated the **GORDON COSENS FOREST**. The purpose of this Agreement was to provide a continuous supply of forest products for the wood processing plant of the Company at Kapuskasing and to ensure that the Gordon Cosens Forest is harvested and regenerated to produce successive crops of timber on a sustained yield basis.

A review of the first five consecutive years of the Agreement was conducted on the Gordon Cosens Forest in 1985. As a result of a favourable report of Company performance of its obligations under the Agreement, the Ministry and Spruce Falls Power and Paper Company Ltd. signed an extension to FMA 500600 on April 22, 1986 with the new Agreement having a term of 20 years commencing April 1, 1985.

The review of the second five-year period (1985-1990) of the Agreement was conducted on the Gordon Cosens Forest to determine whether the obligations of the Company under the Agreement have been satisfactorily performed and to recommend to the Minister of Natural Resources whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of four (the "Committee"), engaged by the Ministry for this purpose. The four Committee members were:

- Mr. John M. Duncanson, B.Sc.F., R.P.F.,
Duncanson Investment Research Inc.,
Review Co-ordinator
- Mr. Ed Markus, B.Sc.F.,
Former Director, Timber Sales Branch, Ministry of Natural Resources,
Committee Chairman
- Ms. Kandyd Szuba, B.Sc.F., Ph.D.,
Private Consulting Biologist
- Mr. Herb Bax, B.Sc.F., R.P.F.,
Manager of KBM Forestry Consultants Inc.

1.3 TASKS OF THE REVIEW COMMITTEE

The Committee's assignment was to undertake a fair and objective review of Spruce Falls Power and Paper Company Ltd. performance on the Gordon Cosens Forest during the second five-year term in respect to its obligations under Forest Management Agreement 500600 and to make recommendations to the Ministry on the extension of the Agreement's term according to the "evergreen" section of the Agreement.

As well the Committee was requested to make conclusions and recommendations on any significant matter concerning the administration of the Agreement by the Ministry of Natural Resources or its implementation by the Company.

The review was conducted by:

- examining the management, operating and annual plans, and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural and access road records for adequacy and for conformity with the management plans and the ground rules of the Agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provisions of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects, and road construction typical of the techniques employed on the forest for conformity with the Agreement holder's records and for field application of the ground rules,
- determining the degree to which other forest users and other forest values are accommodated in the management planning and in field operations,
- meeting with Company and Ministry staff to identify problem areas and Agreement concerns on the part of either party, and,
- as specified in detail in Appendix A - "Terms of Reference for the Second Five-Year Review of a Forest Management Agreement."

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION AND SUBMISSION OF PLANS

The Agreement requires the Company to prepare management, operating and annual plans as well as annual reports. These plans must be prepared and submitted to the Ministry according to the time frame specified in the Agreement and in accordance with the planning manuals approved by the Ministry for this purpose.

The 1985-90 Operating Plan for the Gordon Cosens Forest was submitted on October 1, 1984, prior to the due date and the Ministry began its internal review immediately. The Company and the Ministry went through a process of issue resolution that resulted in the Ministry completing the internal review by March 15, 1985. The public review was completed by late April and the plan received final approval on May 10, 1985, nine weeks past the date for alterations and review to be completed.

The delay in final approval of the 1985-90 Operating Plan led to a three month delay in approval of the 1985/86 Annual Work Schedule. The 1986/87 Annual Work Schedule was submitted on time, however it was three months late in being approved because of the time involved in resolving a number of issues. Subsequent annual work schedules were submitted by the due date and approved by the required date or shortly thereafter.

The production of the new Timber Management Plan, for the period April 1, 1990 to March 31, 1995, has gone awry. The production of the new Ontario Base Maps was delayed and as a result the new FPI for the Agreement area could not be completed by the due date. After discussions with Forest Resources Group, the District received approval by letter dated December 8, 1989 from the Director, Forest Products and Marketing Branch, to proceed with a contingency Operating Plan for the period April 1, 1990 to March 31, 1991. The Agreement area is currently being managed according to the one year contingency operating plan until a new Timber Management Plan incorporating the new FRI data is submitted, reviewed, and approved.

2.1.2 PLAN IMPLEMENTATION

The Agreement requires that the Company conduct its operations in accordance with the approved management, operating and annual plans.

Silvicultural operations and road construction performed by the Company are summarized in Table 1. The Committee randomly examined areas allocated for harvest and road locations specified for construction in the management documents and found the Company records to show these activities were undertaken as planned. An exception was harvest under-cutting which occurred primarily in third party cutting areas. Various locations visited during the field trips confirmed adherence to the plans.

The levels of harvesting and regeneration were 84% and 73% respectively of the approved five-year plan. Explanations for deviations of actual from planned harvest are given in Section 2.3. Total actual regeneration fell 19,236 ha (27%) short of the planned renewal of 70,038 ha (Figure 1). Much of this shortfall reflects the 14,952 ha (17%) shortfall between planned and actual harvest. The remaining 4,284 ha shortfall can be attributed to unreported and untreated areas regenerating naturally, a lack of suitable sites for aerial seeding and some shortages of planting stock.

The 31,061 hectares site prepared represents 97% of the planned amount. If discounted by the 17% undercut in harvest, an over achievement of 4,276 ha is recognized. Some double counting of areas has occurred, as areas chemically site prepared for a proposed prescribed burn were later mechanically site prepared when the burn was cancelled due to weather restrictions.

Table 1

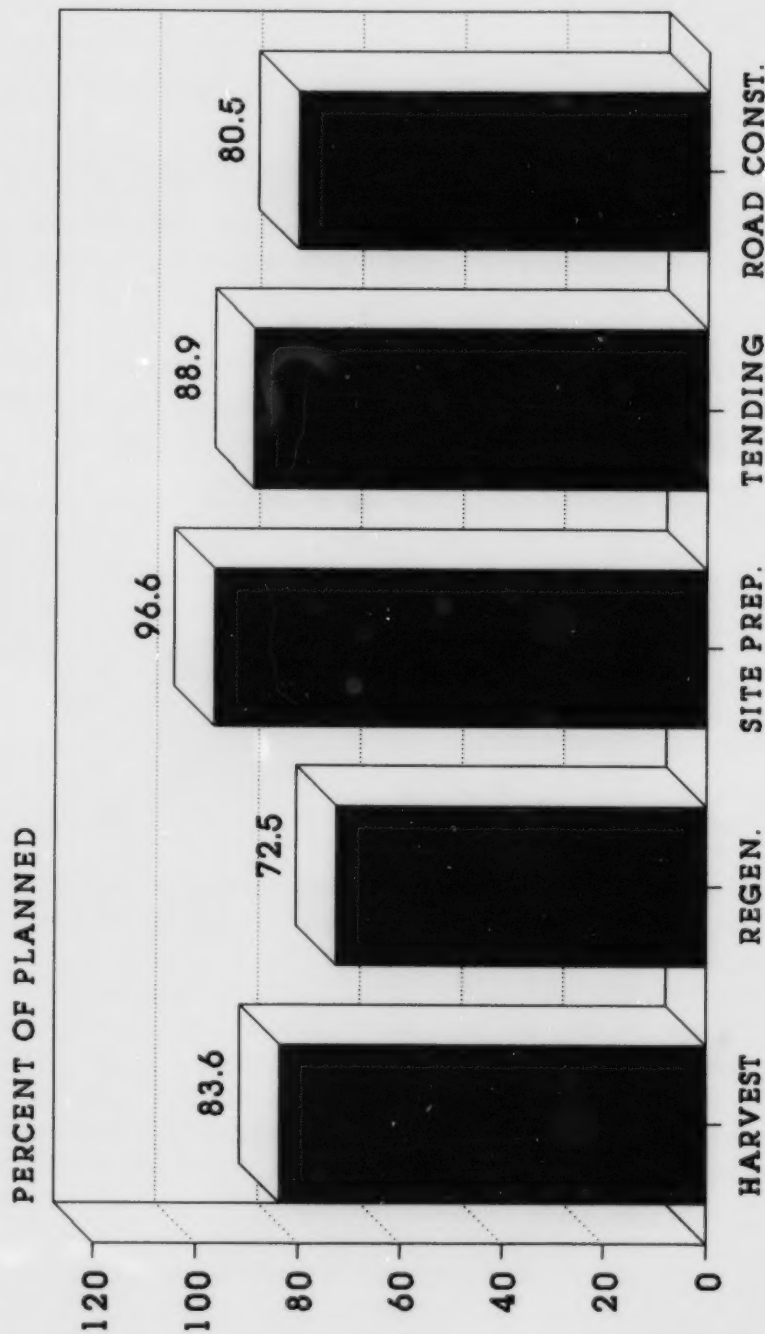
Summary of Company Forest Operations with Ministry Funding

FMA Expenditure and
Accomplishment Report
For The Five-Year Period
1985 - 1990

FMA 500600
Gordon Cosens Forest
Spruce Falls Power & Paper
Company Ltd.

Activity		AREA (hectares)	COST (dollars)
Harvest		74,719	
Natural Regeneration		10,576	
Artificial Regeneration	- Planting	28,111	
	- Blended	12,099	
Total Regeneration		50,786	\$13,961,061
Retreatment		15	\$ 8,784
Site Preparation	- Mechanical	23,548	
	- Chemical	4,217	
	- Prescribed Burning	3,296	
Total Site Preparation		31,061	\$ 7,230,639
Tending	- Chemical Cleaning	68,994	
	- Manual Cleaning	0	
	- Thinning	0	
Total Tending		68,994	\$ 4,901,614
TOTAL SILVICULTURAL PAYMENTS			\$ 26,102,098
		(kilometres)	
Road Construction	- Primary	290.6	
	- Secondary	108.2	
Total Road Construction		398.7	\$ 13,006,283
Road Maintenance		2,299.1	\$ 1,063,209
TOTAL ROAD PAYMENTS			\$ 14,069,492
TOTAL PAYMENTS			\$ 40,171,590

**FIGURE 1: COMPARISON OF 1985-1990
OPERATING PLAN VS. ACTUAL
FMA 500600 GORDON COSENS FOREST**



Source: Annual Reports,
1985-90 Operating Plan.

The tending shortfall of 8,604 hectares (11%) was largely due to weather related problems and a funding restraint in 1989.

It was noted that the Company has successfully managed a five-fold increase in artificial regeneration activities, from 8,736 hectares in the 1980-85 period to 40,225 hectares in the 1985-90 period.

2.2 THE GROUND RULES

2.2.1 KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

Based on discussions and examinations held both in the office and in the field, it was apparent that Company personnel had a thorough understanding of the provisions of the ground rules and the Agreement.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

Silvicultural treatments have been developed over the past ten years that are uniquely adapted to the site and species requirements of the Gordon Cosens Forest and yet meet the constraints imposed by the level of silvicultural funding. The prescriptions in the ground rules are set out in order of priority established by the Company policy that the most productive sites should be given the highest priority for planting and tending. Fifth year stocking and regeneration assessments are carried out on all treated and retreated areas. The Company planted 2 hectares and aerially tended 26 hectares at its own cost. The Committee viewed field trials that the Company had established to test various herbicides and application methods.

The basic methods of regeneration include the following:

- site prepare and plant,
- direct seeding (several forms),
- modified harvest with winter cuts employing "careful logging around advanced growth" (CLAAG) and "group seed trees" (GST),
- modified harvest in the frost-free season using a full tree, high-flotation (tire) system employing Harvesting and Regeneration Options I and II (HARO I and II),
- and natural regeneration to either preferred and/or non-preferred species.

(HARO I utilizes a blend of all regeneration options, whereas HARO II is normally just planting).

The Company has fully integrated the layout, prescription, and implementation of harvesting and silvicultural activities in the field. The Committee was impressed with the transfer and training of prescription/forecasting ability to the field staff (e.g. group seed tree layouts are carried out by the operators of the feller-bunchers). The Forest Ecosystem Classification (FEC) is harmonized with the site descriptions and silvicultural specifications in the ground rules and the camp staff are trained on a regular basis in the use of FEC. A Forestry Awareness Newsletter is published by the forestry staff on a monthly basis for all company staff, detailing forestry concerns and providing a communications link between camp staff, MNR, and forestry personnel.

The Company has developed two seeding techniques for black spruce. One is a seeder attached to a feller-buncher which disburses seed simultaneously while harvesting and the second technique is an aerial seeder which effectively spreads black spruce seed from aircraft.

The Committee commends the Company on the development of the aerial seeder for black spruce, and suggests that the Company make available, upon request, information concerning the seeder to the Ministry and other interested parties.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

Sampling of project records and invoices in the office and the field indicated that procedures as set out in the ground rules were followed correctly.

The use of forms, initialled and signed by both the Ministry and a Company representative, approving payment rates and area counts, provided an audit trail that was clear to examine.

2.2.4 PREPARATION OF NEW GROUND RULES

The new ground rules for the next five-year period are complete and require final, formal approval by the Ministry. No new treatment prescriptions were added however the existing prescriptions were refined incorporating the past five years experience. Of note is the increasing use of HARO I, integrating harvesting and regeneration and thereby reducing the use of the more arduous and costly site preparation/planting option.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS, AND WOOD FLOW

According to paragraph 20(1) of the Agreement the Company has agreed to maintain the level of harvest on the Gordon Cosens Forest at a level between 90% and 110% of the calculated allowable depletion (allowable cut) for each working group. Using paragraph 20(2) of the Agreement, the Company may request the Ministry to authorize variations in the levels specified.

Paragraphs 20(3) and 20(4) of the Agreement provide for a rectification by the Agreement holder of any overcut or liquidated damages, to be paid by the Agreement holder, in the event of an undercut on the Agreement area in a specified five year period. The Agreement holder may avoid liquidated damages through the declaration of timber surplus to its needs in an approved management plan (paragraph 20(6)).

Table 2 and Figure 2 show a comparison of allowable and planned depletion to actual depletions by area (ha).

The undercut in the "other conifer" working group occurred largely in a Company camp area where there were concentrations of this working group. A slight underestimate in the volumes expected to be harvested per hectare caused this modest undercut.

TABLE 2

Depletion of Agreement Area for 1985 - 1990
(hectares)

FMA 500600

Gordon Cosens Forest
Spruce Falls Power &
Paper Company Ltd.

Working Group	Maximum Allowable Depletion	Declared Surplus	Planned Harvest	Actual Harvest	Actual Depletion	Difference Plan - Act Harvest
Spruce	68,675	3,395	65,280	53,735	54,069	+11,545
Fir	3,400	1,860	1,540	1,617	1,618	-77
Jack Pine	4,570	-1,365*	5,935	4,096	4,096	+1,839
Other Conifer	2,820	1,660	1,160	777	789	+383
P02	16,010	3,030	12,960	11,871	11,885	+1,089
P03	5,890	3,475	2,415	2,260	2,261	+155
TOTAL	101,365	12,055	89,290	74,356	74,718	+14,934

* Approved accelerated cut for jack pine working group in the 1985-90 Operating Plan

(1) Planned Harvest = Planned Depletion - Planned Reserves

(2) Actual Harvest = Actual Cut + Bypass

(3) Actual Depletion = Actual Harvest + Reserves + Non-Harvest Depletion

Note: Figures represent 4 years actual data and final year estimated data

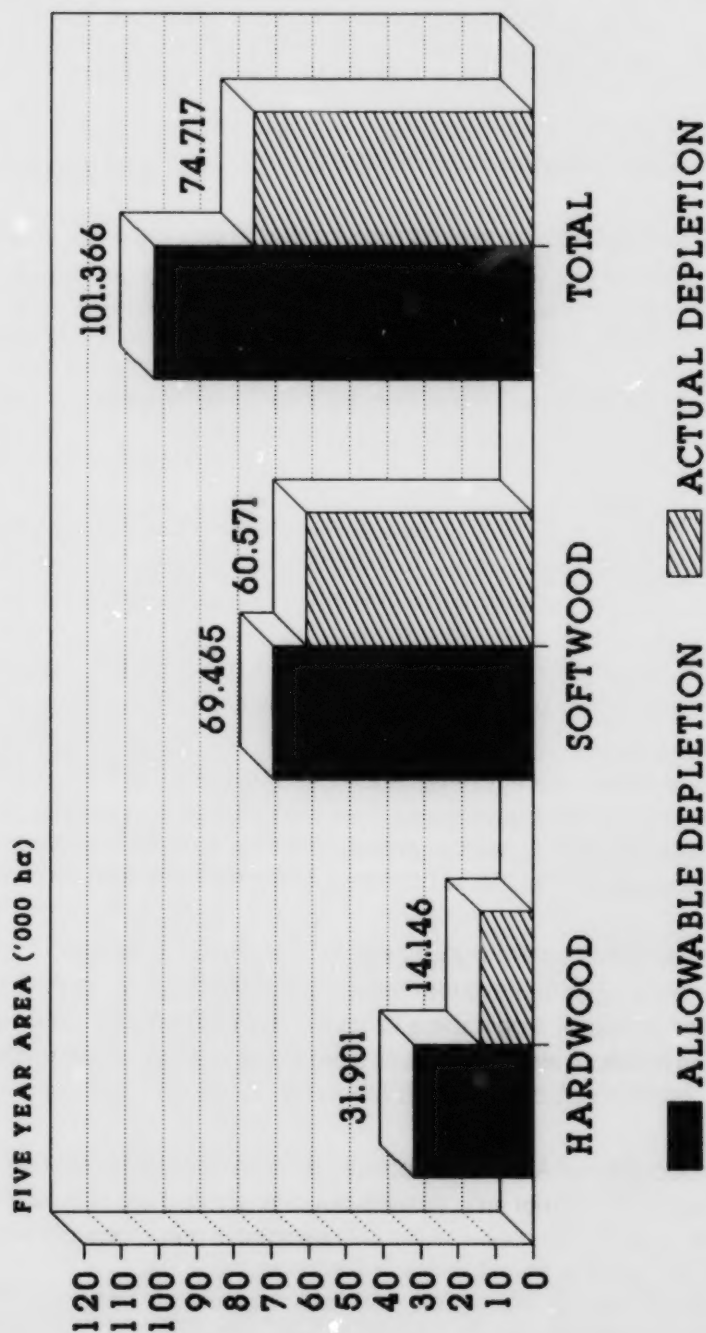
Source: Table 4.1 Report of Depletion by Area 1985 - 90

All other undercut situations occurred in the third party operations. The third party operators working on the FMA include Isabelle Brothers Ltd., Custom Sawmill (Hearst) Ltd., United Sawmill Ltd., and Malette Inc. These third party operators harvest wood from the Agreement area primarily for use at their sawmills.

The main spruce operating area of Isabelle Brothers Ltd. contained, in the opinion of the operator, stands that if harvested would contain trees too small to be used as sawlogs. Many of these stands were left uncut and contributed to the spruce working group undercut.

Custom Sawmill (Hearst) Ltd. encountered stands on its third party operations that had been seriously depleted by spruce budworm, thus lowering the volume harvestable in such stands to extremely low merchantable levels. The operator did harvest some badly budworm infested stands but did not have sufficient alternative areas of higher merchantable volumes to provide some balance and flexibility to his operations. Approximately 25% of the allocated spruce areas were left unharvested.

**FIGURE 2: COMPARISON OF 1985-1990
ALLOWABLE VS. ACTUAL DEPLETION
FMA 500600 GORDON COSENS FOREST**



Note:
 Allow Depl=Plan Harvest & Surplus
 Act Depl=Act Harvest & Non-Harvest Depl

United Sawmill Ltd. realized higher volumes per area during its operations than originally estimated. As well unexpected road right-of-way clearing during the last year of the plan resulted in less wood being cut from planned harvest areas. Malette Inc. harvested a higher volume per unit area than was originally estimated for the jack pine working group in its operating area. This caused the undercut in the jack pine working group for the Agreement area. It should be noted that in most cases the Company does not undertake operational cruise estimates for third party operations. This is the responsibility of the third party operator.

It is the opinion of the Committee that circumstances beyond the control of the Company were responsible for the undercut situation noted in Table 2.

RECOMMENDATION: The Ministry should require that in any third party agreement and/or third party licence between a Forest Management Agreement holder and a third party operator, if the third party is responsible for overcutting or undercutting as defined in the Agreement, that such third party be liable for any remedial action or liquidated damages specified in the Agreement, paragraph 44 (1,2). The third party should have recourse, if applicable, to adjustments similar to that provided for in paragraph 20(2), 20(6), and 41(1) of the Agreement.

The Company should continue to advise the Ministry, as it has in the past five years, of any overcut or undercut on the Agreement area that it feels will persist through the five-year period and where necessary seek the appropriate adjustments as provided for in paragraph 20(2) of the Agreement.

The Company undertakes operational cruising for all the areas that will be harvested by the Company. The excellent records of the operational cruise estimates are consolidated from a block level to a camp area level and finally to a total Agreement area level. Actual volumes harvested were compared to these operational cruise estimates on a camp area basis for 1987/88 and the actual scaled volume varied from the estimated volume in the range of -7.0% to +6.7%. These comparisons are extremely accurate given that many of the stands harvested are in the over-mature category and can be difficult to assess for merchantable volumes.

RECOMMENDATION: The responsibility for undertaking optional cruise estimates in the TMP be clearly understood between the FMA holder and the third party operator. This must then be specified in the third party agreement between the FMA holder and the third party operator and approved by the Ministry. Any damages sought by the Ministry under the Agreement that result from inaccurate operational cruise estimates (i.e. over or undercutting) and not by the estimating party's control will be paid by such party.

The Company provided in excess of 2,300,000 cubic metres of wood for the five-year period 1985-90 from the Agreement area for use by local forest industries such as sawmills, waferboard plants, and veneer mills. This represents 40% of the wood harvested on the Agreement area. This diversion of raw forest products from the Agreement area to such plants is a major factor in maintaining a strong and viable forest products sector in the area. The Company and the Ministry should continue to strive for the maintenance and enhancement of diversified best end-use forest management.

However, of the softwood component harvested by third party operators only 22% (223,000 m³) of the residual wood chips are utilized at the Kapuskasing paper mill. An estimated 800,000 m³ of wood chips derived from wood harvested on the Agreement area are used at other pulp and paper mills. The reason for this situation is the Spruce Falls - Woodlands Union collective agreement which obliges the Company to produce on their operations, 85% of the total Spruce Falls' mill fibre requirement for the operating year concerned. Thus, the amount of fibre which can be supplied by others is limited to 15%. Although the Company's paper mill has adequate wood supply, long-term wood supply security and possible future expansion opportunities may be jeopardized by this restriction.

2.4 NSR OBLIGATIONS

The Not Satisfactorily Regenerated (NSR) Survey that was conducted in 1979 is now outdated as there is a new Forest Resources Inventory dated 1986.

The Company exceeded its five-year NSR treatment obligation by tending 38,423 hectares versus an original target of 37,340 hectares. NSR treated areas were sampled for accuracy in the office and the field. No discrepancies were found.

2.5 ROAD CONSTRUCTION AND MAINTENANCE

Paragraph 31 of the Agreement provides for the Ministry to pay, subject to a maximum amount per kilometre, for the construction or the reconstruction of forest access roads on the Agreement area. To be eligible for payment, roads must be detailed in approved operating and annual plans and constructed according to the standards specified in schedule "H" of the Agreement.

During the ten years of the FMA in the Gordon Cosens Forest, a total of 799.5 km of primary and secondary roads received funding, 402.9 km were built during the last five years. During the period under review, the Company or third party operators built all the roads in their respective harvest areas. Third parties built 54% of these roads, including 36% of the primary roads and 100% of the secondary roads, all mainly on the periphery of the Agreement area. The Company operated mainly in the central portion where gravel is scarce, of poor quality, and the sites are very wet. Under those conditions it was impossible for the Company to haul wood on roads built to secondary standards. Thus the Company constructed only primary roads during 1985-90. In the summer these roads served primarily for access as wood hauling was impossible. This meant that third party operators were forced to travel great distances around the area to bring summer-cut sawlogs to their mills.

Roads invoiced for maintenance were graded, snow plowed, regravelled and repaired in some sections when necessary. Field inspections showed that roads were well-maintained. Roads eligible for FMA funding were inspected by the Ministry to verify standards, locations, and to check lengths. The Company works very hard to ensure that their roads are properly located; survey crews locate future roads up to three years in advance of construction. The Committee verified that the Company's planned and actual road locations corresponded closely by superimposing maps derived from recent aerial photographs onto those that accompanied the original annual plans. A segment of one road built by a third party deviated by more than 500 m from the planned location, but planned and actual locations of other third party roads were within 300 m.

The major objective of FMA road funding, to allow access to older stands first, was achieved. For example, black spruce stands accounted for 73% of the total harvested by the Company in 1985-90 and 68% of these stands were older than rotation age.

2.6 COMPANY RECORDS

The Committee examined in the office and field, records and projects representing all of the silvicultural prescriptions as outlined in the ground rules. No discrepancies were found.

In the Gordon Cosens Forest, each renewal operation (e.g., site preparation, planting, tending) on a given piece of ground is recorded under a unique project number.

Detailed project information is kept on file and the area of operation is marked on FRI township maps. There are separate sets of maps for each type of operation. Presently, there is no way to determine all the activities on a given piece of ground except by scanning the maps. This has been adequate, but the Company plans to modernize its record-keeping system by incorporating all silvicultural data along with depletions into their GIS.

The Company calculates depletions in the following manner: each camp submits cut control maps showing areas of harvest by month, air photos are then taken, harvested areas are transferred to depletion maps, and an electronic planimeter is used to measure the area depleted. Depletion data is then processed in a computer program designed by the Company for this purpose.

2.7 ANNUAL REPORTS

Paragraph 38 of the Agreement requires that the Company prepare an annual report in accordance with the Forest Management Manual summarizing certain aspects of operations during the preceding year.

Annual reports were submitted in two parts, silviculture and road construction in April and depletion in November, in accordance with the TMP manual. Records of submission and approval dates were incomplete in Company files; the Company assumed that the reports were approved by the Ministry once dialogue with the Company had ceased. Both submission and approval dates are important because they help to reveal problems in the conduct of an FMA. The Committee suggests that these dates should be formally recorded on the certification page of the reports.

The Committee compared the area of silviculture projects shown in the annual reports with those for the same work in fifth year summaries and found differences of up to 13% in some categories. According to the Company, inaccuracies in annual reports arise for a number of reasons including late reporting of true values by third parties, and a shortage of time between when the work is done and when it must be reported. For renewal operations such as winter site preparation and natural regeneration, estimates of hectares treated are adjusted after aerial photography of the treated area; adjusted data is usually available too late to be incorporated into the appropriate section of the annual report.

This same problem in reporting was highlighted during the first five-year review when it was recommended that the Ministry establish a procedure for amending the official records (the approved annual reports). However, there remains no amending mechanism.

RECOMMENDATION: That the Ministry put in place, by April 10, 1991, a mechanism to ensure the verification and accuracy of Annual Reports.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 10 of the ground rules of the Agreement, entitled Modified Management Areas (MMAs), explains how the Ministry and the Company will manage certain lands to meet objectives other than or in addition to the production of wood fibre. The Agreement recognizes two types of Modified Management Areas:

- linear MMAs - those that are located along watercourses and roads, and
- non-linear MMAs - which encompass mainly wildlife habitat.

Modified Management Areas have been replaced by the Area of Concern (AOC) planning process.

During preparation of the 1985-90 Operating Plan, MMAs were marked on 1:63,360 scale maps; specific details and refinements of MMAs were negotiated for annual plans. In the interest of optimizing the yield of all resources from the area, it was the intent of the Ministry to allow a diameter-limit type of cut in some of the MMAs. Few of such cuts were performed because they proved to be impracticable; heavy machinery was not allowed inside the reserves. Both the Company and third parties did a commendable job of delineating MMAs in the field. Only two trespass charges were levied by the Ministry.

Initial specifications for water crossings were left up to the Company, which ensures that crossings are environmentally and structurally acceptable. Field inspections showed that the Company employed creative solutions to challenging problems in major crossings in the Gordon Cosens Forest.

The Company uses temporary poplar bridges to provide winter access and the Committee noted that old poplar bridges were not always entirely removed. However, the contingency operating plan for 1990-91 indicates a commitment by the Company to remove future temporary poplar bridges once work in an area is complete. During the period under review, the Ministry conducted a photographic inventory and analysis of all major crossings on driveable roads in the Gordon Cosens Forest. Although not obligated to do so, the Company repaired old crossings in sensitive areas on abandoned roads at their own expense. The Company and the Ministry jointly inspect for adequacy the crossings on active roads each year. The Company operates the only remaining river drive in Ontario. The Ministry, the Ontario Ministry of the Environment, the Federal Department of Fisheries and Oceans, and the Company have undertaken a study to determine the environmental rehabilitation measures necessary when the drive will be discontinued effective November 1994.

Clearcut size is an important wildlife consideration. Field inspections showed that cuts in the Gordon Cosens Forest reflected standards of the times. Cuts were broken up by reserves along waterways, leave blocks, and patches of unmerchantable timber.

Effective size was further reduced by irregular shapes. In many stands, non-preferred species such as poplar, tamarack, and cedar were left standing, providing residual cover for wildlife. The use of herbicides created an abundance of snags when employed in site preparation to eliminate poplar. These snags will benefit wildlife as the surrounding forest matures. The new contingency operating plan shows more direct involvement in habitat management with application of the Timber Management Guidelines for the Provision of Moose Habitat. The Committee has noted that the Company and the Ministry are having difficulty in negotiating and resolving the implementation of the Moose Habitat Guidelines. The critical issue involves the significant increase in "set aside" of productive forest land in the current planning period.

The Company has a very good relationship with other forest users and has, at their own expense, provided materials and work for projects undertaken by Ducks Unlimited, a local Rod and Gun Club, and the Boy Scouts.

3. MAINTENANCE OF PRODUCTIVITY

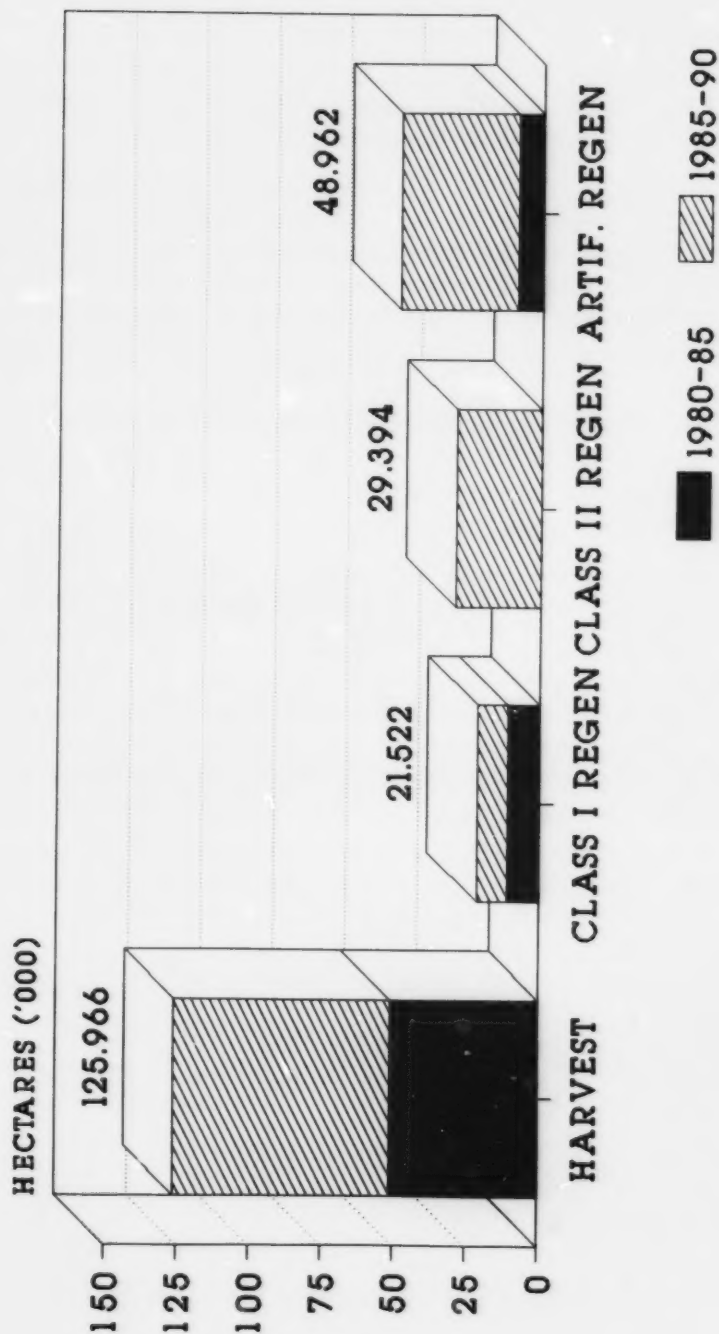
Over the second five-year term of the Agreement, an area equal to 68% of the area harvested was regenerated by seeding, planting, advanced growth and natural regeneration to preferred species. An area equal to 32% of the harvested area is in a transitional stage of forest renewal through natural regeneration to preferred (black spruce) and non-preferred species. These areas are classified in the ground rules and are assessed in the fifth year stocking survey but are not identified or included in the five-year summary.

Hence, the productive forest land base is not accurately reported in the summary. Natural regeneration to non-preferred species is difficult to quantify and assess early since these areas are in a period of transition. The fifth year stocking survey quantifies those areas regenerated to preferred and non-preferred species and should be included in a status report of the Gordon Cosens Forest (Figure 3).

RECOMMENDATION: That two categories of natural regeneration be established for the Gordon Cosens Forest, namely; CLASS I, natural regeneration to preferred species, and CLASS II, natural regeneration to a combination of preferred and non-preferred species (i.e. poplar, tamarack, and cedar), and that a system be developed to attempt to identify at an earlier stage those areas which will be treated for non-preferred species. This would more accurately reflect the current status of the productive forest land base.

At the time of the review, 15,769 hectares of Free to Grow (FTG) areas were released by the Company for MNR verification. At the field visit of some of the FTG areas, it was noted that the plantation data for maintaining the health and growth was known but not recorded. Close liaison with the Federal Government representative of the Federal Insect and Disease Survey Section (FIDSS) at Remi Lake is maintained and the Company and DCR monitor the plantations on a regular basis. However, we do not know if the stocking levels in the FTG plantations (800 trees/ha) are sufficient to

FIGURE 3: 1980-1990 HARVEST AND REGENERATION FMA 500600 GORDON COSENS FOREST



Class I Regen - preferred species only.
 Class II Regen - regenerated to
 preferred and non-preferred species.

offset mortality caused by biotic damage by insects, fungi, or mammals. The dynamics of infestations in second-rotation stands are not clearly understood and are affected by a number of factors including age and size of the plantation, stocking, and density, climate, species, regeneration method, etc. Study plots should be established to record incidences of damage and mortality. The impact of the infestations should be analyzed and incorporated on a regular basis into the yield tables used in timber supply forecasting for the Gordon Cosens Forest.

RECOMMENDATION: That the Company develop a system to ensure that the growth, productivity, and health of the Gordon Cosens Forest is monitored and maintained.

The Company is using a forest harvesting model called FORMAN, which is volume based and can generate several forest harvesting options and is useful as a tool to analyse wood supply options. The Committee reviewed the model but did not have sufficient time to analyse the assumptions used by the Company. The Company had an extensive collection of forest data on the Agreement area.

4. IMPLEMENTATION OF THE RECOMMENDATIONS OF THE FIRST FIVE-YEAR REVIEW

The recommendations resulting from the first five-year review of operations of the Company in the Gordon Cosens Forest and the status of their implementation are as follows:

That the Forest Management Agreement with Spruce Falls Power and Paper Company Ltd. be extended for a further term of five years.

The Agreement was extended by the Minister.

The use of Prescribed Burning by the Company as a site preparation technique is encouraged and should be given a high priority for the treatment of upland sites.

The Company and the Ministry are prepared to continue to discuss the increased use of Prescribed Burns (PBs). The use of PBs will be increasingly more challenging due to the increased use of the full tree harvesting system, which reduces the fine fuel on the cut-overs, and thereby reducing the areas suitable for PBs. The Company has indicated that it is supportive of the increased use of PBs but feels frustrated when proposed PBs in which they have participated in the planning and supplying with equipment and men are delayed or cancelled because of fire control concerns and demands in other parts of the province on the Ministry's local unit crews at the eleventh hour.

Continued monitoring, particularly of the 1980-85 period's silviculture prescription results, should receive a high priority if timely decisions are to be made about the adequacy of these prescriptions.

The Company and Ministry continue to monitor previous silviculture prescriptions.

The Ministry should carefully review work schedule submissions which include road construction costs under approved Third Party arrangements.

According to the Ministry, third party roads have been adequate and the costs realistic.

An amendment procedure should be established between the Ministry and the FMA holder which would govern matters where the official achievement record must be changed for legitimate reasons.

Section 2.7 of this report shows that no action was taken and provides a new recommendation.

5. COMPANY CONCERNS

The Company was provided with the opportunity to express any concerns it had with regard to the FMA 500600 or with regard to the Ministry's administration of the Agreement. Senior management of the Company responsible for administering this Agreement were generally satisfied with the FMA process and with the good relationship with the local staff in regard to administration of the Agreement.

The Company expressed concerns with:

- i) Level of Government Commitment - a diminishing level of commitment to the FMA process by the Ministry, as indicated by the "capping" of the amount of nursery stock available, reduced road funding, and the short notice given in changes to the level of funding,
- ii) The FMA "Partnership" - a diminishing in the feeling of partnership between the Company and the Ministry as shown by unilateral changes or positions implemented by the Ministry particularly in the area of environmental concerns, as well as in the commitments to fund road construction and forest renewal work. The Company finds this to be very disruptive to their ability to plan.
- iii) Moose Habitat Guidelines - the large area set-aside of productive forest land available for harvesting that appears to be resulting from the implementation of the moose habitat guidelines.
- iv) Liquidated Damages - paragraph 20 of the FMA, particularly the portion which deals with liquidated damages for undercutting and costs associated with overcutting in excess of 10% by area of each Working Group, is no longer appropriate in today's planning environment dominated by planning teams and public review. The Company feels strongly that this outdated provision should be removed from the Agreement in the future.
- v) Inflation Formula - the rate of inflation formula used to inflate FMA funding does not keep pace with the actual rate of inflation in the paper and forest industry. The formula used should be modified to more closely reflect the industry's rate of inflation.

6. CONCLUSIONS AND RECOMMENDATIONS

The Committee is satisfied that the obligations of the Company under the Agreement have been satisfactorily performed by the Company during the five-year term under review. In particular the Committee was impressed by the commitment of the Company to effective integrated management of the Gordon Cosens Forest.

The following are the Committees recommendations:

RECOMMENDATION NO.1 : That the Minister extend the remaining periods of FMA 500600 by a further term of five consecutive years to March 31, 2010.

RECOMMENDATION NO.2 : The Ministry should require that in any third party agreement and/or third party licence between a Forest Management Agreement holder and a third party operator, if the third party is responsible for overcutting or undercutting as defined in the Agreement, that such third party be liable for any remedial action or liquidated damages specified in the Agreement, paragraph 20. The third party should have recourse, if applicable, to adjustments similar to that provided for in paragraph 20(2), 20(6), 41(1) and 44(1,2) of the Agreement.

RECOMMENDATION NO.3 : The responsibility for undertaking optional cruise estimates in the TMP be clearly understood between the FMA holder and the third party operator. This must then be specified in the third party agreement between the FMA holder and the third party operator and approved by the Ministry. Any damages sought by the Ministry under the Agreement that result from inaccurate operational cruise estimates (i.e. over or undercutting), and not by the estimating party's control will be paid by such party.

RECOMMENDATION NO.4 : That the Ministry put in place, by April 10, 1991, a mechanism to ensure the verification and accuracy of Annual Reports.

RECOMMENDATION NO.5 : That two categories of natural regeneration be established for the Gordon Cosens Forest, namely; CLASS I, natural regeneration to preferred species, and CLASS II, natural regeneration to a combination of preferred and non-preferred species (i.e. poplar, tamarack, and cedar), and that a system be developed to attempt to identify at an earlier stage those areas which will be treated for non-preferred species. This would more accurately reflect the current status of the productive forest land base.

RECOMMENDATION NO.6 : That the Company develop a system to ensure that the growth, productivity, and health of the Gordon Cosens Forest is monitored and maintained.

7. REVIEW COMMITTEE STATEMENT

We have examined the performance of Spruce Falls Power and Paper Company Ltd. as pertaining to its obligations under Forest Management Agreement No. 500600 (Gordon Cosens Forest) during the past five-year period ended March 31, 1990.

In our opinion, the Company has conformed to the rules as outlined in the Forest Management Agreement.

signed The Review Committee.

The Review Committee

**FOREST MANAGEMENT
AGREEMENTS**

FIRST FIVE-YEAR REVIEWS

1985 - 1990

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INTRODUCTION

In 1985, the Minister released the first five-year reviews of the first five FMAs in the province. A report on the relationship between harvest and growth, including regeneration, of timber for the five FMA areas was tabled in the Ontario Legislature, as required by legislation. All five FMAs were renewed for another five-year term.

Since then, reviews have been conducted every year on those FMA companies which have reached their five-year anniversary mark. All FMAs reviewed thus far have been extended or recommended for extension.

In 1990, four more FMAs were reviewed for the first time and are the subject of this report. The Agreements are:

1. Canadian Pacific Forest Products Ltd., Dog River - Matawin Forest - FMA 502400
2. Canadian Pacific Forest Products Ltd., Brightsand Forest - FMA 502500
3. Kimberly-Clark Canada Inc., Nakina Forest - FMA 502600
4. Kimberly-Clark Canada Inc., Longlac Forest - FMA 502700

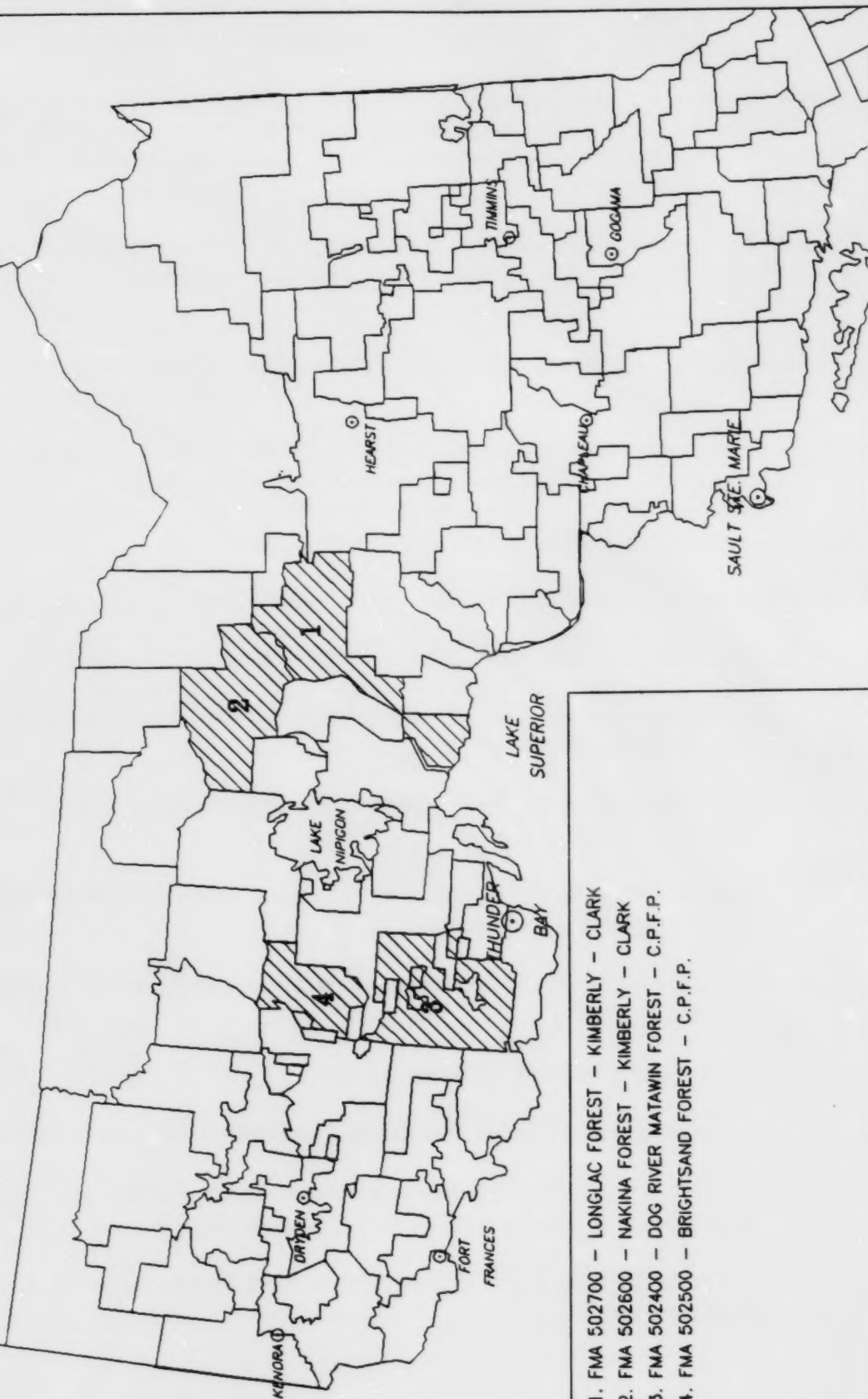
The map on the following page shows the location of these four FMAs.

The objectives of the review, as outlined in Appendix "B", included;

- to undertake a fair and objective review of the performance of the Agreement holder vis-a-vis the obligations under the Agreement.
- to examine company records with regard to their adequacy and their conformity with the Ministry's records.
- to examine the relationships between the predicted and the actual volume/area yields in the timber management plan.
- to examine and report on the relationship between planned and actual wood flow for the five-year period.
- to select and field inspect silvicultural projects.
- to examine and report on the effectiveness of the MNR supported road construction.
- to determine the degree to which other forest users and other forest values have been accommodated in management planning and operations.
- to examine and report on the relationship between the harvest and growth, including forest regeneration.

FOREST MANAGEMENT AGREEMENTS

1990 FIVE YEAR REVIEW



1. FMA 502700 - LONGLAC FOREST - KIMBERLY - CLARK
2. FMA 502600 - NAKINA FOREST - KIMBERLY - CLARK
3. FMA 502400 - DOG RIVER MATAWIN FOREST - C.P.F.P.
4. FMA 502500 - BRIGHTSAND FOREST - C.P.F.P.

- to make recommendations on the extension of the agreements term.

In addition the review team was to:

- examine and report on Company forest management activities conducted beyond the obligations under the agreement,
- examine and report on examples of innovative forestry practices and beneficial forest stewardship,
- examine and report where the Company has taken a positive approach beyond the planning process to address public concerns, and,
- examine and report on Company participation in the field of research and tree improvement.

This report, therefore, summarizes the various forest operations carried out by the four companies and presents the recommendations of the committee which conducted the reviews. The role of the review committee was to assess the commitment of the companies to their obligations as identified in the Agreements.

SUMMARY OF FINDINGS

COMPANY CONCERNS:

During the review process, the committees identified various concerns amongst the Agreement holders. Some of these include;

- The cap on nursery stock has resulted in harvested areas remaining untreated, black spruce sites being converted to jack pine, and the inability to regenerate decadent balsam stands.
- A regional tree planting rate is preferred to an average provincial rate.
- Frequent personnel changes at field level in the Ministry have caused disruption and a lack of continuity. One District Crown Representative cannot adequately administer three FMAs.
- The interpretation of various Ministry guidelines by Ministry staff as being rules not guidelines.
- The reduction of the level of FMA funding for roads.

REVIEW COMMITTEE'S CONCLUSIONS

The committee has recommended that the Minister extend the remaining period of all the FMAs reviewed for a further term of five consecutive years to March 31, 2010.

The committee's conclusions and recommendations for the Brightsand and Dog River-Matawin Forests under agreement with Canadian Pacific Forest Products are very similar. The committee's overall impressions of these two Agreements are as follows:

- the committee was satisfied that the obligations of the Company under the agreement have been satisfactorily performed during the five-year term under review.
- the regeneration targets of these two forests were met but fell short of the area harvested and do not adequately address the long term requirements for spruce. The MAD for the spruce working group is gradually being reduced as upland spruce stands are being converted to jack pine. The mill currently relies on 90% spruce content to maintain the required quality of newsprint. The committee suggests that a co-operative study of mill requirements and availability of spruce is required in order that both parties can agree on a spruce management strategy for sustained yield.
- the committee is also concerned about the long standing poor communications and co-operation between the Company and the Ministry. This communication problem has been aggravated by a very heavy workload and shortage of professional staff. The Company and Ministry may wish to review their manpower requirements in view of the forest management planning process.
- the committee was impressed by the Company's communication with other forest users and consideration of their needs.

The Nakina and Longlac Forests both under agreement with Kimberly-Clark Canada Inc. also have similar review conclusions and recommendations. The committee's overall impressions of the two forests are as follows:

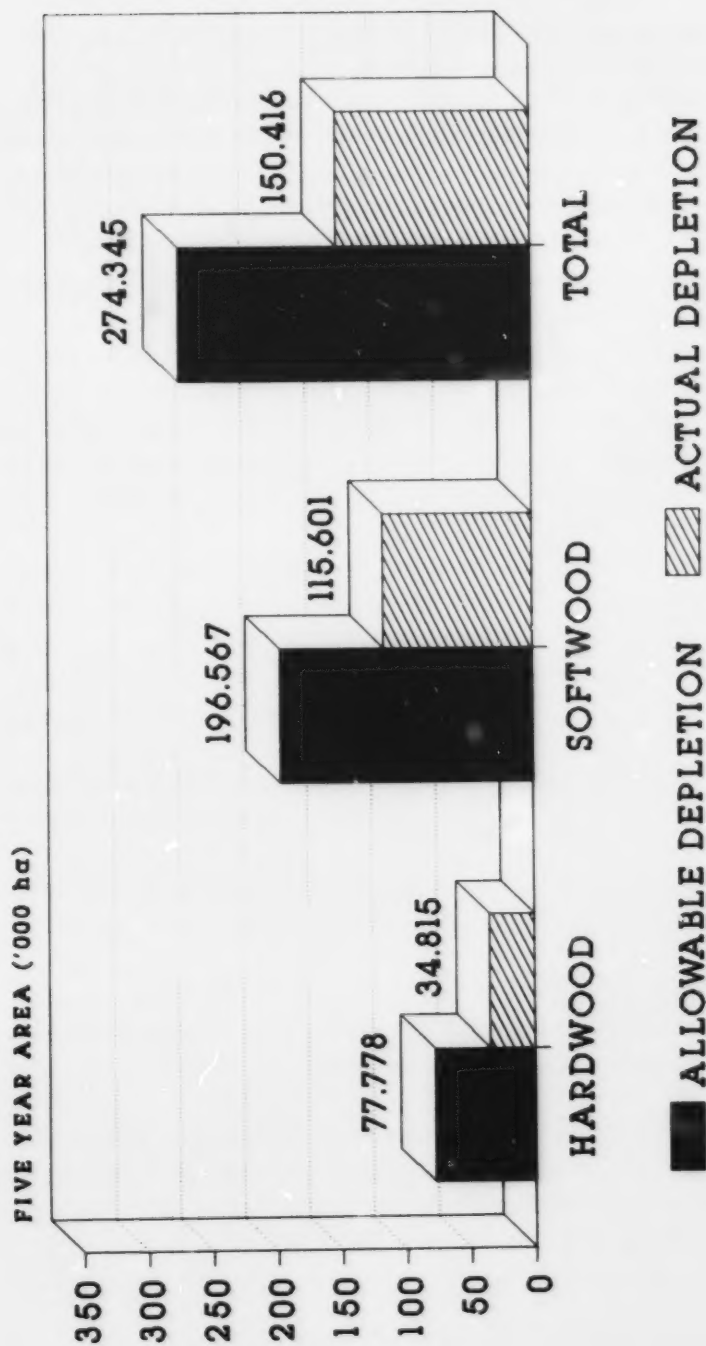
- the committee was satisfied that the obligations of the Company under the agreement have been satisfactorily performed during the five-year term under review.
- the committee was particularly impressed by the co-operation between the Company and Ministry staff, as demonstrated by their solution to management problems in the spruce working group through establishment of three forest units to better reflect management requirements. The Company has also demonstrated its ability to modify harvesting methods and silvicultural prescriptions to successfully regenerate lowland spruce sites.
- the committee is concerned with the quality of natural regeneration in the poplar and birch working groups, aerial herbicide requirements to protect conifer regeneration,

and site preparation on difficult sites. The Company may wish to review their professional staff available for the increasing workload on this FMA.

- the committee was concerned by the dramatic change in the Maximum Allowable Depletion between the 1985-90 and the 1990-95 plan periods and the effect this would have on public perceptions of forestry calculations.
- the committee commends the Company for a very successful artificial regeneration program and a demonstrated ability to address the needs of other users groups.

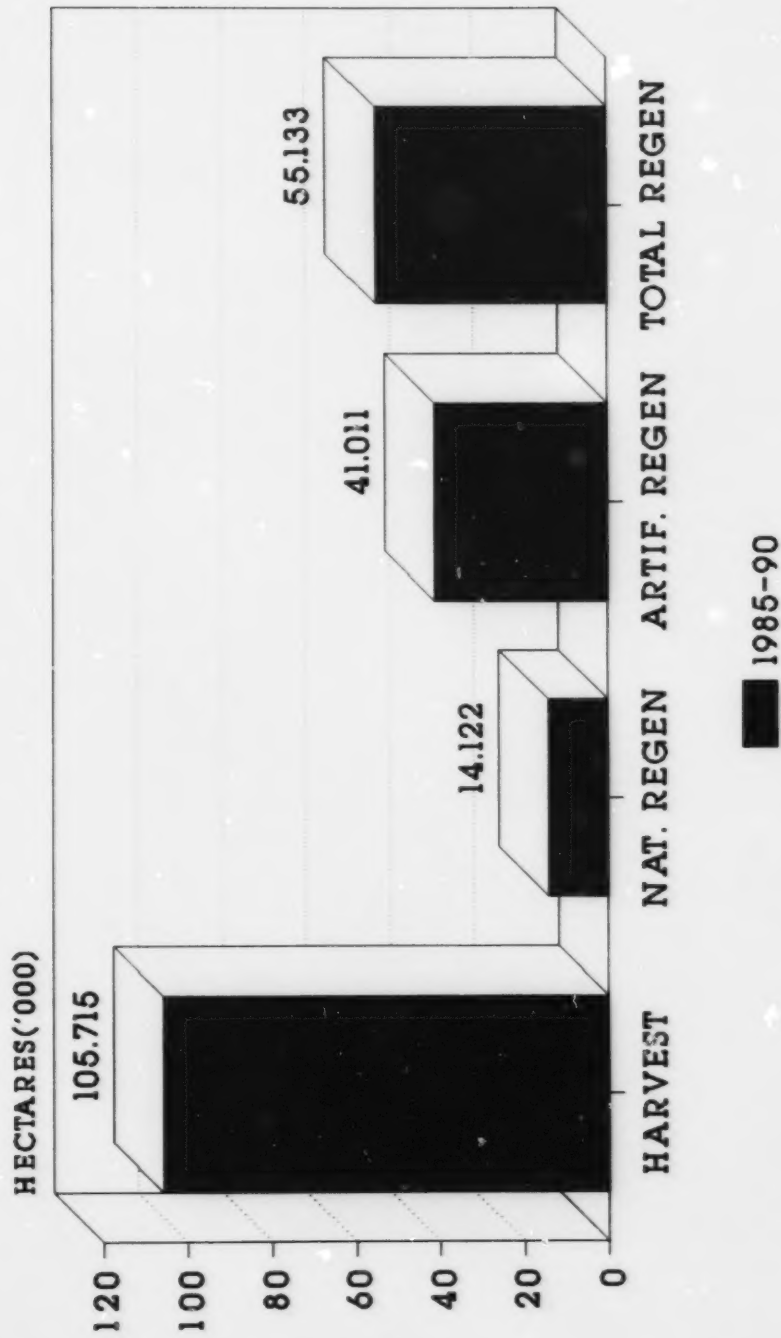
The following two charts represent the comparison of the allowable depletion versus the actual depletion area and the harvest versus regeneration area on all FMAs combined for the 1985-1990 period under review.

COMPARISON OF 1985-1990 ALLOWABLE VS. ACTUAL DEPLETION FMAs 502400, 502500, 502600, 502700



Note:
 Allow Depl=Plan Harvest & Surplus
 Act Depl=Act Harvest & Non-Harvest Depl

1985-1990
HARVEST AND REGENERATION
FMAs 502400, 502500, 502600, 502700



FIVE-YEAR REVIEW

**CANADIAN PACIFIC FOREST PRODUCTS LIMITED
(FORMERLY GREAT LAKES FOREST PRODUCTS LIMITED)**

**DOG RIVER - MATAWIN FOREST
FMA 502400**

1985 - 1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Minister of Natural Resources (the "Ministry") and Great Lakes Forest Products Limited (now known as Canadian Pacific Forest Products Limited) (the "Company") signed a Forest Management Agreement (FMA) (the "Agreement") for the **DOG RIVER - MATAWIN FOREST** located northwest of Thunder Bay, on June 13, 1985. The purpose of this Agreement was to provide for a continuous supply of forest products for the Company's mills at Thunder Bay and Dryden and to ensure that the Dog River - Matawin Forest is harvested and regenerated to produced successive crops of timber on a sustained yield basis.

This review of the first five consecutive years of the Agreement was conducted on the Dog River - Matawin Forest to determine whether the obligations of the Company under the Agreement have been satisfactorily performed and to recommend to the Minister of Natural Resources whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of three engaged by the Ministry of Natural Resources for this purpose. The three committee members were:

- Mr. G. W. Bell, B.Sc.F., R.P.F.,
Vice-President Woodlands (Retired),
Spruce Falls Power and Paper Company Limited,
Committee Chairman
- Mr. C. J. Heeney, B.Sc.F., Dip. R.M.,
Supervisor, Forest Production and Control,
Ministry of Natural Resources (Retired)
- Dr. H. G. Cumming, Professor,
Fish and Wildlife Management, School of Forestry,
Lakehead University

1.3 TASKS OF THE REVIEW COMMITTEE

The review committee's assignment was to undertake a fair and objective review of Canadian Pacific Forest Products Limited performance on the Dog River - Matawin Forest during its first five-year term vis-a-vis its obligations under Forest Management Agreement 502400 and to make recommendations to the Minister of Natural Resources on the extension of the agreement's term according to the "Evergreen" section of the agreement (i.e., Section 15, paragraph 33).

The review was conducted by:

- examining the management, operating and annual plans and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural and access road records for adequacy and for conformity with the management plans and the ground rules of the Agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provisions of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects, and road construction typical of the techniques employed in the forest for conformity with the Agreement holder's records and for field application of the ground rules,
- determining the degree to which other forest users and other forest values were accommodated in management planning and in field operations, and
- meeting with Company and Ministry district staff to identify problem areas and Agreement concerns on the part of either party.

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION OF PLANS

Paragraphs 6(1), 10(1), 11(1) and 15(1) of the Agreement require the Company to prepare management and operating plans and a series of annual plans. These plans must be prepared and submitted to the Ministry of Natural Resources according to the time frame specified in the Agreement and according to the manual that has been approved by the Minister for this purpose. The Forest Management Agreement for the Dog River - Matawin Forest was signed June 13, 1985. The Management Plan was due June 13, 1986 and was actually submitted in September 1986, receiving Ministry approval June 23, 1987.

The operating plan for the five-year period (1985-1990) was due December 13, 1985. A first draft of the plan was submitted in June 1985, rejected by the Ministry and subsequently amended and resubmitted June 17, 1986. This plan was analysed and found consistent with the technical requirements of the Forest Management Manual (1980), reviewed by the public and conditionally approved March 11, 1987.

The conditional approval was received approximately one year later than the time schedule set out in Section 10(4) of the Agreement. The principal concern on the part of the Ministry causing this delay was the allocation and depletion of overmature spruce stands and their effects on long-term wood supply.

The five annual plans or work schedules were all prepared, analysed and approved within the time frame specified in the Agreement.

The new Timber Management Plan (TMP) for the Dog River - Matawin Forest for the second five-year term (1990-1995) has been prepared in accordance with the Timber Management Planning Manual for Crown Lands in Ontario (1986). The initial draft of the plan was prepared in September 1989 but was rejected by the Ministry for the same reasons as outlined in the conditional approval of the 1985-1990 operating plan. At the time of this review, the TMP has been resubmitted and is presently following a detailed implementation schedule to complete the plan before August 31, 1990. With no approved TMP, a contingency plan was prepared to permit operations to take place from April 1, 1990 to August 31, 1990.

The Company and the Ministry have experienced considerable difficulty in operational planning, extending over two planning periods, for the Dog River - Matawin Forest. Agreement on the allocation and depletion of over-mature spruce stands and an acceptable wood supply strategy is a long standing problem. Present staff on both sides are optimistic that the current TMP initiative will be completed to the satisfaction of both parties by the due date of August 31, 1990.¹

RECOMMENDATION: That the Company and Ministry resolve the long standing problems related to wood supply, which have delayed the completion and approval of plans required under the Forest Management Agreement for the Dog River - Matawin forest to ensure that future plans conform to the schedule specified in Sections 6 to 11 of the Agreement.

2.1.2 PLAN IMPLEMENTATION

The Agreement requires that the Company conduct its operations in accordance with the approved management, operating and annual plans. The accomplishments of the Company in silvicultural operations and road construction are shown in Table 1.

The review committee has examined Company planning documents and performance records supplemented by ground inspections for harvest cut, road construction and silvicultural operations. The comparison of actual achievement with planned levels is portrayed in Figure 1.

Effective April 1, 1985, an area of some 97.8 sq. km. containing budworm damaged timber south of Shebandowan Lake was removed from the FMA area and licensed to Great West Timber for five years but was returned to the Company at the end of the fourth year. Harvesting and silvicultural operations performed on this area are included in this report.

Figure 1 shows that the Company harvested only 60% of the area approved for harvest, (refer to Section 2.3) but exceeded all silvicultural targets in the first five years of the agreement. To put this into perspective, the planned forest renewal of 20,787 hectares was only 28% of the 74,484 hectares Table 1

1 NOTE: TIMBER MANAGEMENT PLAN COMPLETED BY DUE DATE.

Table 1

Summary of Company Forest Operations with Ministry Funding

FMA Expenditure and
Accomplishment Report
For The Five-Year Period
1985 - 1990

FMA 502400
Dog River - Matawin Forest
Canadian Pacific Forest
Products Limited

Activity		AREA (hectares)	COST (dollars)
Harvest*		44,907	
Natural Regeneration		6,460	
Artificial Regeneration	- Bareroot	5,324	
	- Planting Container	9,423	
	- Seeding - Direct	5,045	
	- Seeding - Site Prep	117	
	- Scarification	313	
Total Regeneration		26,682	\$ 5,434,559
Retreatment		0	
Site Preparation	- Chemical	1,394	
	- Mechanical	20,985	
	** - Prescribed Burn	362	
Total Site Preparation		22,741	\$ 4,406,375
Tending	- Chemical - Aerial	8,417	
	- Manual Cleaning	77	
Total Tending		8,498	\$ 1,104,526
TOTAL SILVICULTURAL PAYMENTS			\$ 10,945,460
		(kilometres)	
Road Construction	- Primary	24.5	\$ 701,714
	- Secondary	202.8	\$ 2,744,700
Total Road Construction		227.3	\$ 3,446,414
Road Maintenance		331.2	\$ 319,342
TOTAL ROAD PAYMENTS			\$ 3,765,756
TOTAL PAYMENTS			\$ 14,711,216

* Salvage area cut by GWT is included in the above area

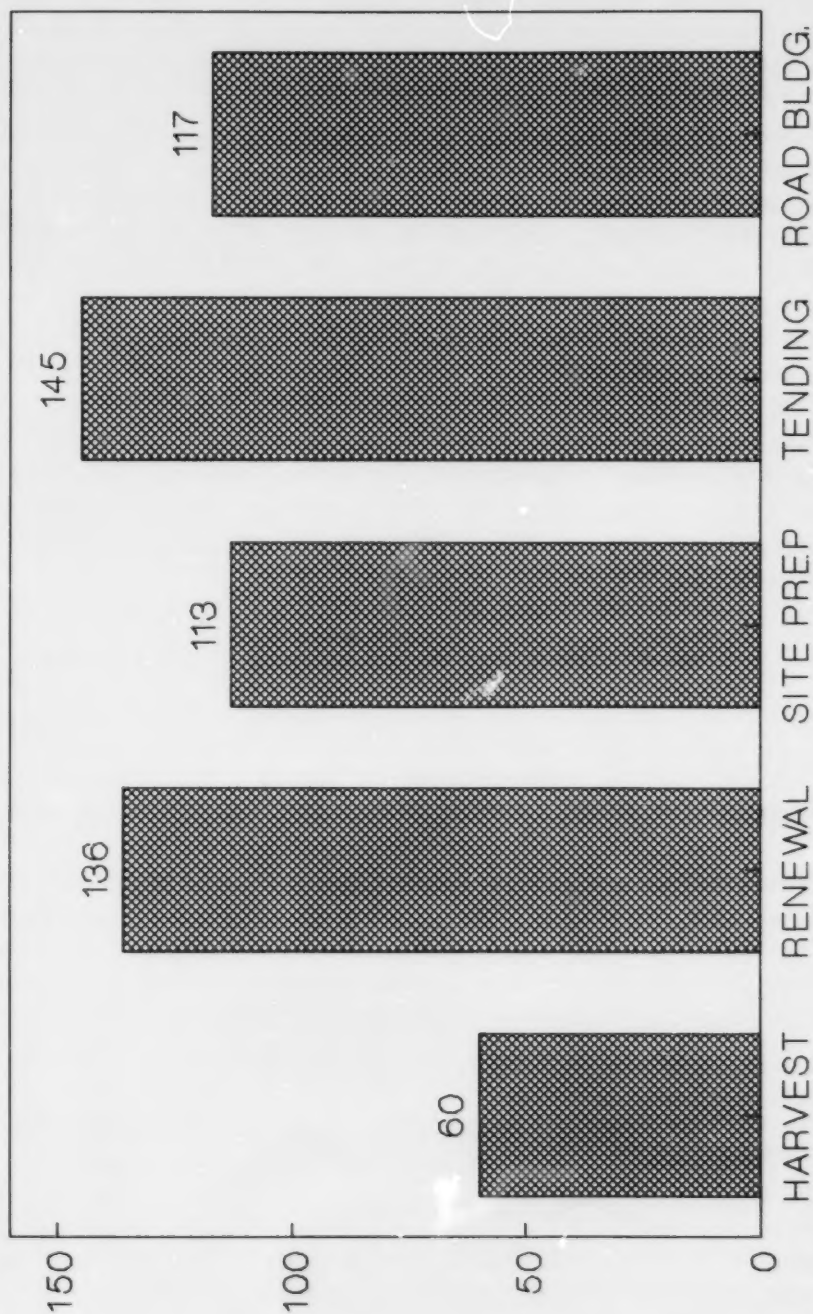
** Preparation for burning

NOTE: This table represents activities carried out by the Company and the associated costs to MNR. As part of the MNR obligation under the agreement, Forest Management activities were also conducted by MNR, at additional expense.

Data Source: Audit Section 6.4.1 supplied by CPFP.

FIGURE 1: COMPARISON OF OPERATING PLAN VS ACTUAL

PERCENT OF PLANNED FMA 502400 DOG RIVER-MATAWIN FOREST



Data includes GWT.

Source: Table 4.1 December 6, 1990.

Renewal, site prep., tending - 5th yr. annual report - Table 6.4.1

Road building - 5th yr. annual report - Table 6.6

planned for harvest. The actual total forest renewal of 28,289 hectares was 63% of the 44,907 hectares of actual harvest, an improvement on the plan, but still well short of the regeneration needs.

In the new TMP the committee was advised that planned forest renewal is 48,678 hectares or 92% of the 52,700 hectares planned for harvest. However almost all the increase, 18,000 hectares, is unassisted natural spruce and poplar regeneration. More details on silvicultural accomplishments will be found in Section 2.2.2. Conformity of Harvest and Silvicultural Operations with the Ground Rules.

The harvest cut and road construction records of the Company generally conform to the area allocated for harvest and the road locations specified in the documents. Achievement in road construction exceeded the planned. Maps of actual road locations differed from the Operating Plan map in only a few places. Most were small changes caused by difficult terrain. These small deviations should be eliminated in future by ground inspections of the route at the planning stage. Larger deviations were authorized by major amendments to the plan. For example, the Wawiag River road location was altered to avoid a private mining claim patent, and a river crossing was altered to accommodate an outfitter.

For the review period there were three major and eighteen minor and administrative amendments to the plan. The major amendments all dealt with revised and increased allocation of harvest area. The net result was the addition of 5,300 hectares of allocated stands to meet the requirements of Ministerial directives for third party operators and to attempt to salvage budworm damaged timber south of Shebandowan Lake.

Minor amendments dealt with changes in the road plan and Areas of Concern (AOCs).

2.2 THE GROUND RULES

2.2.1 KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

The Company forestry staff are located in the Woods Office in Thunder Bay and at various field locations on four FMAs and other Crown Timber licenses. The review team dealt principally with the staff in Thunder Bay while reviewing the Dog River - Matawin Forest. Many of the staff perform specialized functions and were found to be knowledgeable and familiar with the Agreement and ground rules usually pertaining to their area of responsibility and previous positions held.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

Through examination of silvicultural records, field inspections and discussions with Company staff and the Designated Crown Representative (DCR), the review committee confirmed that harvesting and silvicultural operations were conducted in accordance with the ground rules.

Harvesting operations, served by a well developed road system, are carried out in a variety of locations throughout the forest by commuter operations from Thunder Bay, live-in company camps, and third party operators.

On upland spruce sites, the principal silvicultural activity is tree planting. Five to six million black spruce containers and bareroot stock have been planted annually in the five years under review. The Company wishes to expand this part of the program to ensure a long term spruce fibre supply but is limited by the Ministry planting cap and funding levels. Based on Company records and field sites visited, the review committee was favourably impressed by the size and quality of the planting program. To increase the impact of this planting program on wood supply, the Company may wish to consider the use of pre-cut site selection, more intensive silvicultural practices and eventually, larger planting stock from genetically improved seed sources to legitimately reduce rotation age and increase yields.

Site preparation is carried out on planting and aerial seeding sites using a modified Koehring harvester equipped with power heads or barrels and chains, tractors with barrels and chains or a two row Bracke scarifier equipped for herbicide application. A local contractor has two powered disc-trenchers which the company plans to use, but no sites were visited. These powered disc-trenchers do excellent work in other areas and should be investigated thoroughly for use on the Dog River - Matawin Forest.

Stand tending is essential in the successful establishment of spruce plantations. Sites are productive and competition from aspen, raspberry, shrubs and grasses was visible to some degree on all sites visited. The Company has an active release program using aerial application of the herbicide Vision wherever possible. Many sites visited have already been released with good results, and many of these will need another treatment. Two of the sites visited were badly suppressed by aspen or grass and may fail. The 8,500 hectares of aerial release in this five-year period will have to be significantly increased in the next five years to ensure success of the spruce planting program on the highly competitive sites of the Dog River - Matawin Forest.

Sites suitable for jack pine are normally site prepared for aerial seeding. Characteristic of the northwestern part of the province, and based on field visits and discussions with foresters, these sites were found to be regenerating well with present treatment methods, and with proper tending will be successful.

In the first five-year period under review, while the Company exceeded its silvicultural targets, it regenerated only an area equal to 63% of the area harvested, the remaining 37% (16,618 hectares) was left as unassisted natural regeneration.

Modified cutting in strips or blocks has been done prior to the FMA with some success. In the spruce working group, planned cut modifications on selected sites remain an option to increase the area of successful natural regeneration and increase stocking at minimal cost.

In the poplar working group, sites can be chosen and harvested to enhance aspen regeneration without costly treatments. Through these and other methods, successful natural regeneration can be increased and the productivity maintained or improved.

The ground rules permit the designation of certain sites as non-treatable by mutual agreement. While the Company is to be commended for their forest renewal program, they have not declared any area non-treatable in the first five-year period of the Agreement. Although non-treatable areas are

presently a very small proportion of the cut-over area on the Dog River - Matawin Forest, the Committee feels that recognition and reporting of non-treatable sites will contribute to a more accurate forest inventory.

RECOMMENDATION: That 1) the Company review the status of lands cutover during this five-year term, (1985-1990), for which Table 1 of the ground rules specifies treatment, but which have received no treatment or plan for treatment, and 2) the Company propose areas to be classified as non-treatable to the Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to the preparation of the 1995-2015 Timber Management Plan.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

The invoicing procedures of the Company were found to be in general conformity with those specified in paragraph 6.0 of the Ground Rules. The procedure followed does not always result in approval of the invoice and several instances were reported both by the Company and the Ministry of a final invoice being returned for clarification or correction. Hopefully, the new method described in Section 2.6 Company Records, will improve accuracy in invoicing procedures.

2.2.4 PREPARATION OF NEW GROUND RULES

The Forest Management Agreement with the Company requires both parties to commence the preparation of new ground rules for the next five-year term at least eight months prior to the expiry of the old ground rules, and to agree upon those new ground rules on or before that expiry date of March 31st, 1990. At the time of this review, the new ground rules were prepared and agreed to by Company and Ministry staff.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS AND WOOD FLOW

According to paragraph 29(1) of the Agreement, the Company has agreed to maintain its harvest on the Dog River - Matawin Forest at a level between 90% and 110% of the maximum allowable depletion (MAD) for each working group in each five-year term. The Company may request the Minister to authorize variations to the levels specified in the Agreement.

Paragraphs 20(3) and 20(4) of the Agreement provide for either a remedy or liquidated damages in the event of an overcut or undercut, respectively, on the area under Agreement. The Agreement holder may avoid liquidated damages through the declaration of timber surplus (paragraph 20(5)) to its needs in an approved management plan; however, liquidated damages do not apply in the first five-year term of a Forest Management Agreement.

Table 2 provides information in hectares by working group, the maximum allowable depletion (MAD) from 1985 - 1990, the total depletion, actual harvest, total regeneration and the maximum allowable depletion for 1990 - 1995. Approximately 63% of the area cut was regenerated during the five-year

term. This percentage is low partly because of a June 13, 1985 signing of the Agreement which gave the Company very little time to renew any harvested area in the first year. First year renewal was 17% of the annual harvest while 81% was renewed in the fifth year. In the new TMP, the Company is committed to 92% renewal of the available area, 37% as unassisted natural regeneration.

A forecast overcut of 3,771 hectares was predicted in the five-year period (Figure 2) because of the need to overcut (9,902 hectares) spruce, balsam and other conifer working groups being killed by the spruce budworm. At the same time a 6,131 hectares undercut surplus was declared in the jack pine and hardwood working groups, resulting in the above 3,771 hectares overcut forecast. Table 3 shows that the Company did not meet its harvest obligations in any of the working groups, but harvested 74% and 72% respectively of the forecast harvest from the jack pine and spruce working groups. The poplar working group was only 55% of forecast due to the shutdown of the waferboard plant early in the five-year term.

RECOMMENDATION: That in the event the Company should forecast harvest levels during the second five-year term to fall below the 90% harvest level stated in the plan, the Company should take immediate action to request, with reasonable explanation, an undercut variation from the Minister and to amend its management plan with a further surplus declaration.

In calculating the planned harvest area, an FRI yield of $84.6 \text{ m}^3/\text{hectares}$ was used. The actual yield for the five-year term was $119.3 \text{ m}^3/\text{hectares}$ an increase of 41% over planned yield. Figure 2 illustrates the reduction of the planned harvest area of 74,484 hectares to the actual harvest of 44,907 hectares which, coupled with 7,004 hectares non-harvest depletion, gives a total depletion of 51,911 hectares. The total depletion is equal to 73% of the MAD (70,713 hectares). The Company has used a more realistic yield of $122.7 \text{ m}^3/\text{hectares}$ to predict the harvest area for the next five-year term. The forecasting of area harvest was very difficult during this five-year term as much of the allocated area was severely damaged by the spruce budworm and as a result some areas allocated at the beginning of the period were inoperable in the latter part of the five-year period due to higher than predicted conifer mortality. These areas were by-passed and areas with higher yields replaced the budworm stands that could not be salvaged.

Table 4 compares forecast and actual volumes harvested. Volume harvested was 91% of forecast yet the area harvested was only 60% of forecast (Table 3). This 31% spread highlights the need for better and more up-to-date information required for five-year commitments. Predicting harvest forecasts within 90%-110% by working groups is difficult since harvested area varies with species requirements, changing markets, availability of wood from private sources, mill production, third party operations on the FMA and the above large discrepancy in yield estimates. The Company has recognized this problem and is currently developing a Geographical Information System (GIS) which together with accurate data will ensure that information will be up-to-date and available when required. The committee commends the Company for this initiative.

Eighty percent of the wood from this FMA is used in four Company mills - a newsprint mill which must operate with 90% spruce fibre to produce an acceptable product, a softwood and hardwood kraft mill utilizing jack pine, spruce, balsam and poplar, and a conifer studmill, as well as a waferboard mill (closed in 1986) using poplar. The other 20% goes to third party sawmills and a poplar veneer mill operation, as well as sawlogs sorted by the Company to fulfill sawmill directive.

TABLE 2

Comparison of the 1985-1990 Maximum Allowable Depletion, Harvest and Renewal Activities and the 1990-1995 Maximum Allowable Depletion. (Hectares)

FMA 502400
Dog River/Matawin Forest
Canadian Pacific Forest
Products Limited

Working Group	1985-90 Maximum Allowable Depletion	Total Depletion	Actual Harvest	Renewal Total	1990-95 Maximum Allowable Depletion
Spruce	17,555	16,877	14,658		14,717
Jack Pine	13,295	9,659	9,112		11,836
Balsam Fir	12,848	11,533	8,920		10,456
Poplar	20,438	11,329	10,173		18,632
Birch	6,577	2,247	865		5,947
Other Conifer		265	179		
TOTAL	70,713	51,910	44,907	28,291	61,588

DATA SOURCE:

MAD 1985-1990 - Table 4-2 Operating Plan

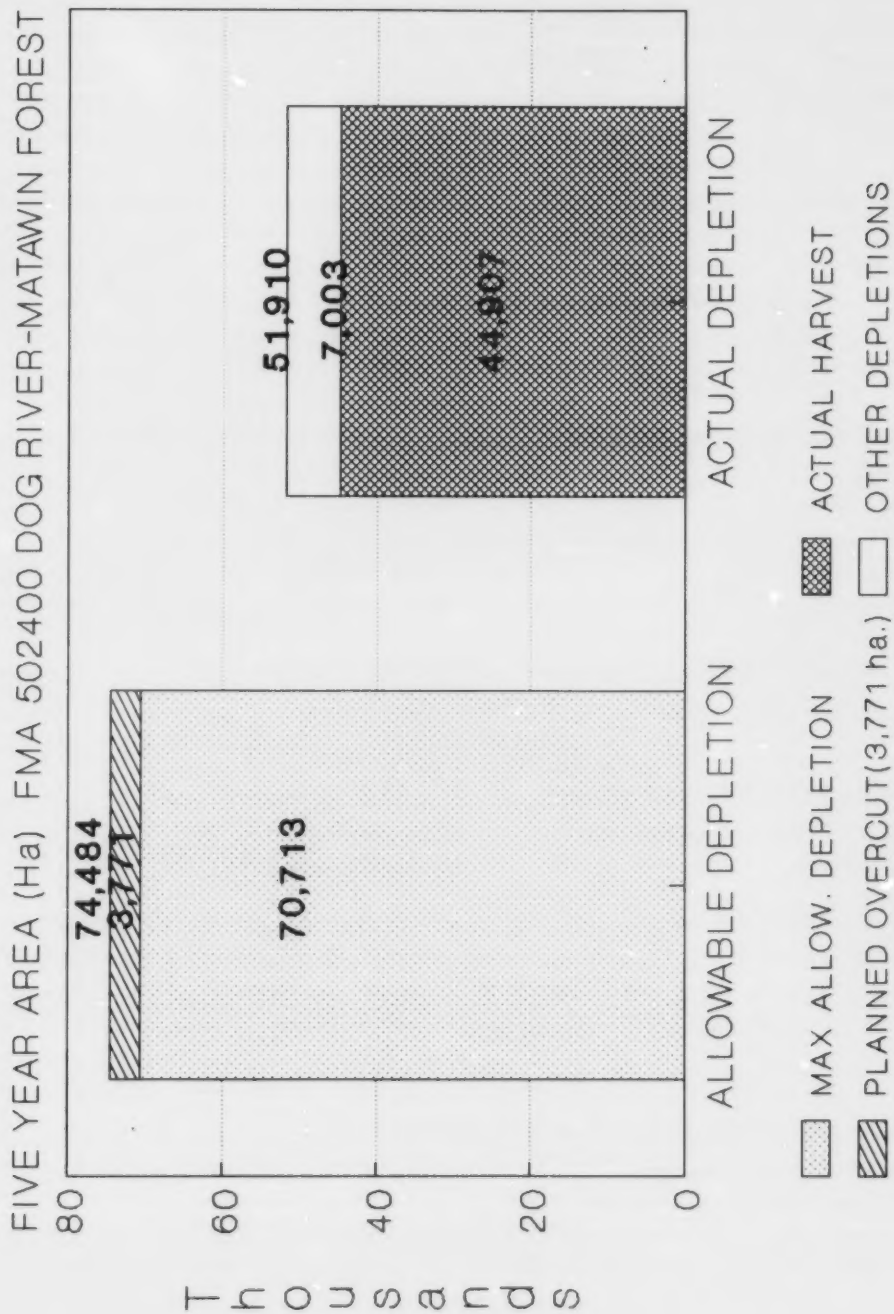
Total Depletions - Table 4.1 December 6, 1990
Actual Harvest

Renewal - Report of Past Operations Table 4.4
Co. - MNR Renewal

MAD 1990-95 - New Timber Management Plan

(Ministry phase-out operations included in renewal total; Budworm salvage area by Great West Timber is included in harvest and renewal area.)

FIGURE 2: COMPARISON OF ALLOWABLE DEPLETION AND HARVEST



N.B. - Third party salvage area included

TABLE 3

Comparison in hectares of the Maximum Allowable Depletion, Forecast Harvest from the Operating Plan and Actual Harvest levels by Working Group for the Period 1985-1990 and the percentage difference between the Forecast Harvest and Actual Harvest.

FMA 502400
Dog River/Matawin Forest
Canadian Pacific Forest
Products Limited

	1985-1990 MAD	Declared Surplus	Forecast Harvest	Actual Harvest	% Actual vs Harvest
Spruce	17,555	-	20,343	14,658	72
Jack Pine	13,295	1,044	12,251	9,112	74
Balsam Fir	12,848	-	19,477	8,920	46
Poplar	20,438	1,999	18,439	10,173	55
Birch	6,577	3,088	3,489	1,865	53
Other Conifer	-	-	485	179	37
TOTAL	70,713	6,131	74,484	44,907	60

N.B. Salvage harvesting by Great West Timber is included in the above data.

TABLE 4

Comparison of forecast and actual volumes in cubic metres (m³) by species and the percentage difference.

FMA 50240
Dog River/Matawin Forest
Canadian Pacific Forest
Products Limited

Species	Forecast m ³	Actual m ³	Percent Actual vs Forecast
Spruce	1,775,750	2,028,928	114
Jack Pine	1,234,140	1,634,583	132
Balsam & Other Conifer	692,120	668,614	97
Poplar	2,536,205	1,391,544	55
Birch	60,000	10,497	17
TOTAL	6,298,215	5,734,166	91

Data Source: Table 4.3.1 June 22, 1990

2.4 NSR OBLIGATIONS

Under provisions of the Agreement, the Company has an obligation to reforest NSR (Not Satisfactorily Regenerated) lands at the rate of 5% of Class 2 and 3 NSR lands annually. This amounts to a total of 3,831 hectares for the five-year term under review and 15,322 hectares for the entire twenty-year period of the Agreement. Company tending operations during the five-year period have concentrated on releasing conifer plantations in current cut-over. Much of the area classified as NSR 2 and 3 has regenerated to mixed wood stands (poplar-spruce-jack pine) and is beyond economic conversion to conifer. It has been reclassified as Free-to-Grow in mainly the poplar working group thus adversely affecting the Company's declared future need for more spruce regeneration required for their newsprint process. A total of 13,401 hectares has been declared FTG of which 81 hectares of NSR 2 land received a tending treatment (Figure 3). This leaves 1,921 hectares to be regenerated during the remainder of the twenty-year period (1985-2005). While the committee recognizes the excellent tending effort by the Company on the recent cut-over areas, achieving 145% of their objective, it is concerned that Company obligations to reforest NSR 2 and 3 lands under the Agreement have not been met.

RECOMMENDATION: That the Company and the Ministry, as per paragraph 25 of the Agreement, establish a schedule for the review and if required, treatment of the remaining 1,921 hectares of NSR land, in the fifteen-year period (1990-2005). This will ensure that the land is reforested with such species of trees as are compatible with the nature and quality of the NSR lands and the timber required by the Company's mills and plants.

RECOMMENDATION: That the Minister recognize 13,320 hectares of natural regeneration occurring on previously classified NSR 2 and 3 land and credit this to the Company's original NSR obligation of 15,322 hectares.

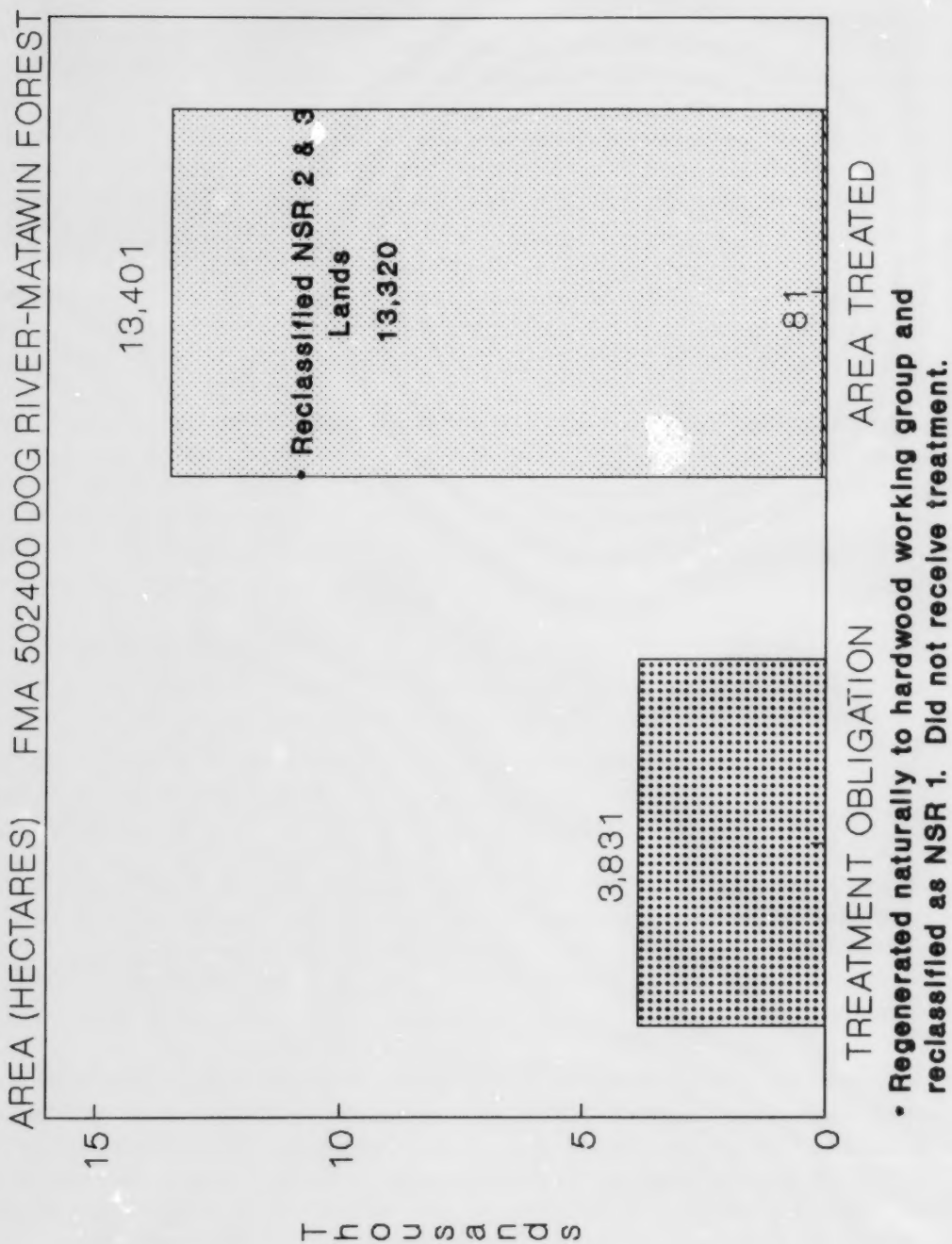
2.5 ROAD CONSTRUCTION

Paragraph 31 of the Agreement provides for the Minister to reimburse the Company, subject to a maximum amount per kilometre, for the construction, reconstruction, and maintenance of forest access roads on the Agreement area. To be eligible for payment, roads must be included in approved annual plans and constructed according to the standards specified in Schedule "E" of the Agreement.

On the Dog River - Matawin Forest, an extensive network of roads existed prior to the signing of the FMA. Major access was provided by Highways 17 and 11, totalling about 150 km. In addition some 309 km of primary road and 470 km of secondary road had been built before 1985 (not including roads that have fallen into disuse). With this extensive road network in place, most of the road building during the first five years of the FMA aimed at reaching mature stands that had not been harvested, or upgrading older roads to FMA standards.

Table 1 shows that only 24.5 km of primary road was built and even that length was much more than the 6.1 km planned. In contrast 202.8 km of secondary roads were built, and 331.2 km of roads were maintained. In addition, the Company built and maintained many more roads at their

**FIGURE 3: COMPARISON OF NSR TREATMENT OBLIGATIONS
AND NSR TREATMENT 1985-90**



own expense. For example, in 1989-1990, they maintained 471.5 km of road at Company expense.

On the Dog River - Matawin Forest, all roads receiving payment are built by the Company or major third party licencees. Roads were to be examined jointly by a Ministry and a Company representative to verify standards and measure lengths. Despite this procedure, on several occasions, roads have not been up to Ministry standards and only percentages of total costs have been paid. In two instances, roads were paid for only at secondary rates after the Company had submitted invoices at primary rates.

RECOMMENDATION: That the Company ensure that the roads are built to FMA standards prior to invoicing.

2.6 COMPANY RECORDS

The records kept by the Company's Woodlands office for access roads, forest depletion and silvicultural projects were examined by the review team. FMA road data is filed together with maps and invoices in file folders. An overview map of the Forest (Scale 1:63,680) is kept for ready reference. Annual harvest and depletion records are compiled by age class and working group on permanent depletion maps (Scale 1:15,840), colour coded for each category of depletion. Depletion data are summarized in the annual report.

The review team was advised that the Ontario Wood Supply Forest Productivity (O.W.O.S.F.O.P.) model database is updated periodically to ensure that total depletion is reflected in the five-year MAD calculations. There is some misunderstanding between Company and Ministry foresters concerning the depletion records and subsequently, the land base used in the MAD calculations, particularly in the spruce working group. They are presently working together to resolve this item.

Silvicultural project data is sent by the camp forester to the DCR for verification of the area treated and work performed. When this is agreed to, it is returned to the camp forester who submits the data to the Woods Office to be plotted on mylar planimetric maps and filed by half base map. Silviculture cards are filed by base map and FMA. The project data is entered into the computer which produces the invoices for silviculture payment and various summaries for annual reports and other Company needs.

Company maps are digitized and a program is being prepared this year so that silvicultural data can be entered directly onto the map and area generated. The Company expects this to be operational during the 1990 - 1995 term and are commended for their progressive approach in adopting this new technology.

Silvicultural assessment and stocking records are maintained by the Company through the Free-to-Grow stage. All data entry, calculations and reports are computerized under the Company assessment system.

The review committee was favourably impressed by the maps and data produced by the Company. However, in working with the summaries of data used in annual reports and produced for the five-year review, many small discrepancies were found, causing tables to be revised. Ultimately, annual report tables had to be used in this review.

2.7 ANNUAL REPORTS

Paragraph 38 of the Agreement requires that the holder prepare an annual report in accordance with the TMP, summarizing certain aspects of operations during the preceding year.

The annual report of Company operations on the Dog River - Matawin Forest is submitted as a silviculture report, as specified in the Agreement, with a separate depletion report, on November 15. No record is kept of when they are submitted by the Company or received by the Ministry; however, both agree that date of submission has not been a problem. The reports themselves consist only of the specified tables with no written statements of problems, highlights including an explanation of target achievements, amendments and other significant events in the year. These would be most useful at the time of the five-year review.

RECOMMENDATION: That annual reports include a descriptive section to report the year's highlights including an explanation of target achievements, amendments and other significant events. Submission dates of all annual reports are to be recorded.

The accuracy of silvicultural reporting was checked by calculation of area using a dot grid. Two site preparation areas agreed with the area reported, a third was within 5%. One tree planting project was reviewed and the reported area verified.

Many errors were found in road data in annual reports. Although road totals in two annual reports were correct, errors were found in other annual reports. Errors included Table 6.6 of the 1986-87 annual report omitting the cost figure for one road, Table 6.6 of the 1988-89 Annual Report containing an error of 0.3 km in one road that was then carried forward into the totals, and Table 6.6.1 of the 1989-90 Annual Report listing 472 km of non-payment road as secondary road when it should have been listed as maintenance.

RECOMMENDATION: That the Company 1) submit accurate reports and that the Ministry verify completeness and accuracy of the data in each annual report in the 1990-95 period for the Dog River - Matawin Forest, and 2) ensure that five-year summaries for the ten-year FMA review in 1995 agree with data from the annual reports.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 9 of the Ground Rules, entitled Modified Management Area (now called Areas of Concern, AOCs) explains how the Ministry, in consultation with the Company, will identify and delineate on FRI Forest Stand Maps during the preparation of each five-year operating plan, areas to be managed to meet objectives other than those of wood fibre production. It states that some form of harvesting and regeneration is intended in these areas where possible. The Minister and the Company recognize

two types of AOCs (1) linear - along roads and waterways, and (2) non-linear - moose habitat, heron rookeries.

This aspect of the Agreement was planned for in Section 12 of the Management Plan where three categories of fish and wildlife management prescriptions were listed:

- 1) modifications to routine timber harvesting practices,
- 2) application of timber reserves, and
- 3) management of road location and road use for access control

Accommodation of other users was detailed even further in the Operating Plan where a complete listing of AOCs and their prescriptions completed the comprehensive planning for other users.

Only two remote tourist outfitters are located in the Dog River - Matawin Forest area. The Company negotiated with them individually. Several changes in road locations and river crossings were made to accommodate them and temporary travel restrictions were placed on one road during fishing season. These restrictions were quite well respected. Cottaging is important in the Dog River - Matawin forest and the Company has held several meetings with cottagers' organizations regarding such issues as buffer width along lake shores. In one area individual cottagers were consulted and road plans changed to prevent a traffic loop near their area of interest. An issue remains unresolved concerning Bedivere Lake where a Ministry remote cottage lot plan is at odds with planned timber harvest in the area.

The Company deals with trappers on a one-to-one basis, with over fifty on the mailing list. Wider reserves have been placed around some trapper cabins and trappers are given keys to Company gates. In return the trappers are often called upon to remove nuisance beaver.

Mining and prospecting activities are common in the area, but do not cause a great problem. Maps with exploratory grids are available from the Recorder's Office. However, in one location a proposed prescribed burn had to be abandoned due to staking in the area.

The Company co-operates well with the Ministry in locating and protecting eagle and osprey nests. Moose corridors and other AOCs are identified by Ministry and Company personnel collectively so as to leave uncut areas that are suitable for moose while minimizing the loss of merchantable timber. The resulting landscape looks much more hospitable to moose than pre-FMA scenes. Some larger clear-cuts were observed during the field trips, but these were mainly due to the salvage operations.

In general the Company tries to accommodate hunters by minimizing the sizes of no-hunt areas. However, two large planned no-hunt areas have been established in the forest. One of these followed an early Company initiative in cutting to produce aesthetically pleasing landscapes. Since the result was also beneficial to moose, the Ministry established a no-hunting area to provide an opportunity for viewing moose.

Possible impacts on water quality from road building are relatively small on the Dog River - Matawin Forest due to the extensive road system already in place, and the few streams that require crossing by new roads. Only one major bridge was built during the first five years. The approaches were well handled for preventing erosion. A few culverts were sited marginally high, but most of these seemed

to involve waters of little or no fishery value. Water quality guide-lines were applied flexibly but judiciously, further protecting water quality with areas of concern. Unfortunately, this generally good record was marred by three incidents in which fishery AOCs were violated. In each case, incursion was less than 1 hectare.

RECOMMENDATION: That the Company ensure that everyone from planners to field personnel are aware of the location and importance of Areas of Concern to minimize any future incursions.

3. MAINTENANCE OF PRODUCTIVITY

Table 2 shows that the maximum allowable depletion (MAD) which was calculated at the beginning of the five-year term for the Dog River - Matawin Forest to be 70,713 hectares for all working groups. Harvest and other forest depletions totalled 73% of the MAD for all working groups.

The sustained yield management of black spruce on the Dog River - Matawin Forest is a major concern to the review committee. Some of these matters are mentioned in other sections of this report but are reviewed here out of concern for the long term productivity of the FMA.

The spruce working group as currently identified in the Forest Inventory is made up of upland and lowland sites. Several factors contribute to our concern and are common to all sites, i.e. the overmature age classes and losses to spruce budworm, windthrow and fire.

The upland sites are the most productive, contain the largest trees and are the easiest to harvest. In the period under review, the total depletion of spruce was 96% of the MAD while all other working groups, including balsam, were well below the MAD. While there are no figures to confirm our concerns, the committee believe that a large proportion of the spruce cut came from upland spruce sites. These upland sites can only be successfully regenerated to spruce by site preparation, planting and tending. At present the extent of these plantations is determined by Ministry funding constraints and the planting cap not by the area available for treatment. Alternate regeneration methods include the planned conversion of some forest associations in the spruce working group to jack pine and/or poplar. While this will help maintain productivity it does not maintain the supplies of spruce required by the Company for pulp and newsprint production.

The lowland spruce sites are less productive and much of the area is characterized by dense stands of small trees classified as Site Class III, too small to harvest and by-passed by current Company operations. These stands represent an overestimation of inventory and an expanded MAD of unknown magnitude. In addition those lowland sites that are harvested are being left for unassisted natural regeneration.

Prior to the FMA the Company co-operated with the Ministry in modified harvest cutting (strip block and group seed trees) on lowland spruce sites with some success. Since 1985, the Company has ceased modified harvest cutting and relies on clear-cutting and unassisted natural regeneration for all spruce lowlands. At the same time it has reduced the spruce rotation age in the 1990-1995 TMP for

100 years to 95 years. The committee feels that these measures are completely inadequate to maintain the productivity of lowland sites in the current spruce working group.

A third factor in the productivity equation concerns the Company dependence on spruce presently set at 90% for newsprint. A thorough review of these requirements over the long term together with dependable alternate supplies of spruce fibre must be undertaken by the Company. Then in cooperation with the Ministry, decisions must be made concerning spruce fibre requirements and management strategies to achieve sustained yield.

Problems associated with spruce inventory and the MAD calculation have been resolved in another district by the splitting of the spruce working group into three forest units, with individual rotation ages. The committee feels that this problem must be resolved immediately to ensure sustained yield management of spruce on the Dog River-Matawin Forest.

RECOMMENDATION: That the Company and the Ministry review the management of the spruce working group with the intention of dividing the existing working group into more than one forest unit, each with its own rotation age and management prescription. This will permit a more realistic calculation of the spruce MAD to be used in the preparation of the new TMP scheduled for implementation April 1, 1995.

Renewal treatments were conducted on 26,814 hectares during the five-year term. A few of the areas treated for spruce renewal will result in marginal success due to severe vegetation competition caused by an inadequate renewal prescription. In general the Company is having good success in all phases of artificial regeneration treatments. A seed tree harvest cut for natural regeneration of lowland spruce is achieving the desired spruce renewal on this wet site. Regeneration by aerial seeding may be too successful on some tree-length harvested jack pine stands. The high density of seedlings from the residual cones plus the aerial seeding may result in the need to thin these overcrowded stands. The Company has experimented with aerial seeding treatments of less than 50,000 seeds per hectare to correct this density problem.

RECOMMENDATION: That the Company review existing data and literature on aerial seeding and, if necessary, enter into a co-operative aerial seeding experiment with the Ministry relating sites, mineral soil exposure (MSE) and residual seed sources, to jack pine seed required per hectare. The objective of the experiment is to develop a silvicultural prescription to regenerate jack pine stands with adequate spacing and good stocking while preventing the need for thinning these stands in future years.

To further address long-term productivity, the Company has entered into a co-operative tree improvement and seed orchard project with the Ministry and other companies in the area. In addition the Company has successfully experimented with a herbicide sprayer mounted on a Bracke site preparation unit. This will reduce the need for aerial herbicide release on many site prepared areas. Aerial release will still be required on areas prepared when the brush competition is not in leaf.

4. COMPANY CONCERNS

The Company was provided an opportunity to express any concerns regarding FMA 502400 or the Ministry's administration of the agreement. The following are the concerns expressed by Canadian Pacific Forest Products Limited:

- i) Currently one District Crown Representative (DCR) administers three FMAs with Ministry technicians responsible for most field problems. In addition there have been four DCRs in the last five years. These factors have resulted in a possible lack of continuity and professional evaluations as well as poor communications causing misunderstandings in the administration of this FMA.
- ii) The tree planting cap has resulted in harvested areas remaining untreated, black spruce sites being converted to jack pine, and the inability to regenerate decadent balsam stands. In addition, aerial seeding of jack pine, while less expensive in the short term, may require expensive tending treatments in future years.
- iii) Other concerns are as follows:
 - a need for more and smaller prescribed burns.
 - MNR budget requirements and Annual Work Schedules (AWS) are not compatible.
 - the inability to move funding from program to program or between FMA's.
 - the duplication of work required for herbicide applications to both the MNR & MOE rather than one agency.
 - the silvicultural and road construction work is normally not completed in time for AWS November 30th submission. January 1st submission is requested.
 - FRI maps are not detailed enough to meet current planning requirements.
 - other users such as tourism, mining and general recreation do not pay a fair share of forest usage.
 - a regional tree planting rate is preferred to an average provincial rate.

5. CONCLUSIONS AND RECOMMENDATIONS

The review committee was satisfied that silvicultural obligations of the Company under the Agreement have been satisfactorily performed during the five-year term under review. The regeneration targets on the Dog River - Matawin Forest were met but these targets fell well short of the area harvested and do not adequately address the long term requirements for spruce. The committee is concerned about two problems: 1) the long standing poor communications and co-operation between the Company and the Ministry, and 2) the management of the spruce working group on this forest and all CPFP FMAs and licences.

The communication problem has been aggravated by a very heavy work load for both parties coupled with a shortage of professional staff. The Company and Ministry may wish to review their manpower requirements in view of the increased demands in the forest management planning process.

The management and regeneration of the spruce working group is a concern as many stands included in the MAD calculation are by-passed or partially cut. An updated inventory of these stands is necessary for accurate management of the spruce working group. In addition, the planting cap and the reduction of the spruce working group is perceived to be a problem by the Company who currently require 90% spruce in their newsprint process. The committee suggest that a co-operative study of mill requirements and long term availability of spruce is required in order that both parties can agree on a spruce management strategy for sustained yield.

The committee was impressed by the Company's communication with other users, and consideration of their needs. We commend the Company for their commitment to multiple land use.

The following are the committee's recommendations:

RECOMMENDATION NO. 1: That the Minister extend the remaining period of FMA 502400 by a further term of five consecutive years to March 31, 2010, pending approval of the new Timber Management Plan by the Ministry.

RECOMMENDATION NO. 2: That the Company and Ministry resolve the long standing problems related to wood supply, which have delayed the completion and approval of plans required under the Forest Management Agreement for the Dog River - Matawin Forest to ensure that future plans conform to the schedule specified in Sections 6 to 11 of the Agreement.

RECOMMENDATION NO. 3: That 1) the Company review the status of lands cutover during the five-year term, (1985-1990), for which Table 1 of the ground rules specifies treatment, but which have received no treatment or plan for treatment, and 2) the Company propose areas to be classified as non-treatable to the Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to the preparation of the 1995-2015 Timber Management Plan.

RECOMMENDATION NO. 4: That in the event the Company should forecast harvest levels during the second five-year term to fall below the 90% harvest level stated in the plan, the Company should take immediate action to request, with reasonable explanation, an undercut variation from the Minister and to amend its management plan with a further surplus declaration.

RECOMMENDATION NO. 5: That the Company and the Ministry, as per paragraph 25 of the Agreement, establish a schedule for the treatment of the remaining 1,921 hectares of NSR land, in the fifteen year period (1990-2005). This will to ensure that the land is reforested with such species of trees as are compatible with the nature and quality of the NSR lands and the timber required by the Company's mills and plants.

RECOMMENDATION NO. 6: That the Minister recognize 13,320 hectares of natural regeneration occurring on previously classified NSR 2 and 3 land and credit this to the Company's original NSR obligation of 15,322 hectares.

RECOMMENDATION NO. 7: That the Company ensure that roads are built to FMA standards prior to invoicing.

RECOMMENDATION NO. 8: That the annual reports include a descriptive section to report the year's highlights including an explanation of target achievements, amendments and other significant events. Submission dates of all annual reports are to be recorded.

RECOMMENDATION NO. 9: That the Company 1) submit accurate reports and that the Ministry verify completeness and accuracy of the data in each annual report in the 1990-1995 period for the Dog River-Matawin Forest, and 2) ensure that five-year summaries for the ten-year FMA review in 1995 agree with data from the annual reports.

RECOMMENDATION NO. 10: That the Company ensure that everyone from planners to field personnel are aware of the location and importance of Areas of Concern to minimize any future incursions.

RECOMMENDATION NO. 11: That the Company and the Ministry review the management of the spruce working group with the intention of dividing the existing working group into more than one forest unit, each with its own rotation age and management prescription. This will permit a more realistic calculation of the spruce MAD to be used in the preparation of the new TMP scheduled for implementation on April 1, 1995.

RECOMMENDATION NO. 12: That the Company review existing data and literature on aerial seeding and, if necessary, enter into a co-operative aerial seeding experiment with the Ministry relating sites, mineral soil exposure (MSE) and residual seed sources to jack pine seed required per hectare. The objective of the experiment is to develop a silvicultural prescription to regenerate jack pine stands with adequate spacing and good stocking while preventing the need for thinning these stands in future years.

FIVE-YEAR REVIEW

**CANADIAN PACIFIC FOREST PRODUCTS LIMITED
(FORMERLY GREAT LAKES FOREST PRODUCTS LIMITED)**

**BRIGHTSAND FOREST
FMA 502500**

1985 - 1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Ministry of Natural Resources (the "Ministry") and Great Lakes Forest Products (now known as Canadian Pacific Forest Products Limited) (the "Company") signed a Forest Management Agreement (FMA) (the Agreement) for the Brightsand Forest, located northwest of Thunder Bay on June 13, 1985. The purpose of that Agreement was to provide for a continuous supply of forest products to the Company's mills at Thunder Bay and Dryden, Ontario and to ensure that the forests of the Brightsand Forest are harvested and regenerated to produce successive crops of timber on a sustained yield basis.

This review of the first five consecutive years of the Agreement was conducted on the Brightsand Forest to determine whether the obligations of the Company under the Agreement have been satisfactorily performed and to recommend to the Minister of Natural Resources whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of three, engaged by the Ministry of Natural Resources for this purpose. The committee members were:

- Mr. G. W. Bell, B.Sc.F., R.P.F.,
Vice-President Woodlands (Retired),
Spruce Falls Power and Paper Company,
Committee Chairman
- Dr. H. G. Cumming, Professor,
Fish and Wildlife Management,
School of Forestry, Lakehead University, and
- Mr. C. J. Heeney, B.Sc.F., Dip. R.M.,
Supervisor, Forest Production and Control (Retired),
Ministry of Natural Resources.

1.3 TASKS OF THE REVIEW COMMITTEE

The review committee's assignment was to undertake a fair and objective review of Canadian Pacific Forest Products Limited's performance on the Brightsand Forest during its first five-year term vis-a-vis its obligations under Forest Management Agreement 502500 and to make recommendations to the Minister of Natural Resources on the extension of the Agreement's term according to the "Evergreen" section for the Agreement (i.e. Section 15, paragraph 33).

The review was conducted by:

- examining the management, operating and annual plans, and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural and access road records for adequacy and for conformity with the management plans and the ground rules of the Agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provisions of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects, and road construction typical of the techniques employed on the forest for conformity with the Agreement holder's records and for field application of the ground rules,
- determining the degree to which other forest users and other forest values are accommodated in management planning and in field operations, and
- meeting with Company and Ministry district staff to identify problem areas and Agreement concerns on the part of either party.

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION OF PLANS

Paragraphs 6(1), 10(1), 11(1), and 15(1) of the Agreement require the Company to prepare management and operating plans and a series of annual plans. These plans must be prepared and submitted to the Ministry of Natural Resources according to the time frames specified in the Agreement and according to the manual that has been approved by the Minister for this purpose.

The Forest Management Agreement for the Brightsand Forest was signed June 13, 1985. The management plan was due June 13, 1986 and was submitted on August 25, 1986 but this plan was not approved. When no agreement on the management plan had been reached by 1988, the Ministry and the Company agreed to the preparation of a new plan following the Timber Management Planning Manual for Crown Lands in Ontario 1986 rather than the old format. The new Timber Management Plan was produced for a twenty-one year period beginning April 1, 1989.

The operating plan for the first five-year period (1985-1990) was due December 13, 1985. It was first submitted May 24, 1985 and was amended and resubmitted several times until receiving conditional approval March 12, 1987. The principal areas of concern to the Ministry were conflicts with other users and the road plan, as well as determining an acceptable allocation of overmature conifer stands.

The new Timber Management Plan for the Brightsand Forest for the six-year period April 1, 1989 - March 31, 1995 was prepared one year early because there was no approved Management Plan and to tie in with the establishment of the new Brightsand River Provincial Waterway park. The concerns expressed in the approval of the previous operating plan were resolved sufficiently to allow the TMP to be submitted on June 26, 1989 and approved July 14, 1989.

The annual plans or work schedules were all prepared and approved within the time frame specified in the Agreement.

In conclusion, for the period under review, the Company generally prepared draft plans on time. However, the management and operating plans were not acceptable to the Ministry and both parties appear to have had great difficulty reaching agreement through compromise on planning issues.

It was very apparent to the review committee that the planning process can never work until a spirit of trust and co-operation exists between the parties concerned. Senior management in Government and Industry must not only direct their staff in this regard, but set a clear example by their own actions.

RECOMMENDATION: That the Company and the Ministry resolve the long standing problems related to wood supply which have delayed the completion and approval of the plans required under the Forest Management Agreement for the Brightsand Forest to ensure that future plans conform to the schedule specified in Sections 6 to 11 of the Agreement.

2.1.2 PLAN IMPLEMENTATION

The Agreement requires that the Company conduct its operations in accordance with the approved management, operating and annual plans. Contrary to the agreement, there was no approved management plan for the first four years. The current TMP (1989-1995) was in effect for the fifth year of the review.

The accomplishments of the Company in silvicultural operations and road construction are shown in Table 1.

The review committee has examined company planning documents and performance records supplemented by ground inspections for harvest cut, road construction and silvicultural operations. The comparison of actual achievements with planned levels is portrayed in Figure 1.

The harvest cut and road construction records generally conform to the area allocated for harvest and road locations specified in planning documents. Small deviations from planned routes were due to the planning of roads from maps without adequate field inspection. A few more substantial deviations resulted from concerns of tourist outfitters. These were covered by major amendments. Some planned roads were not built due to one logging camp being closed.

Table 1

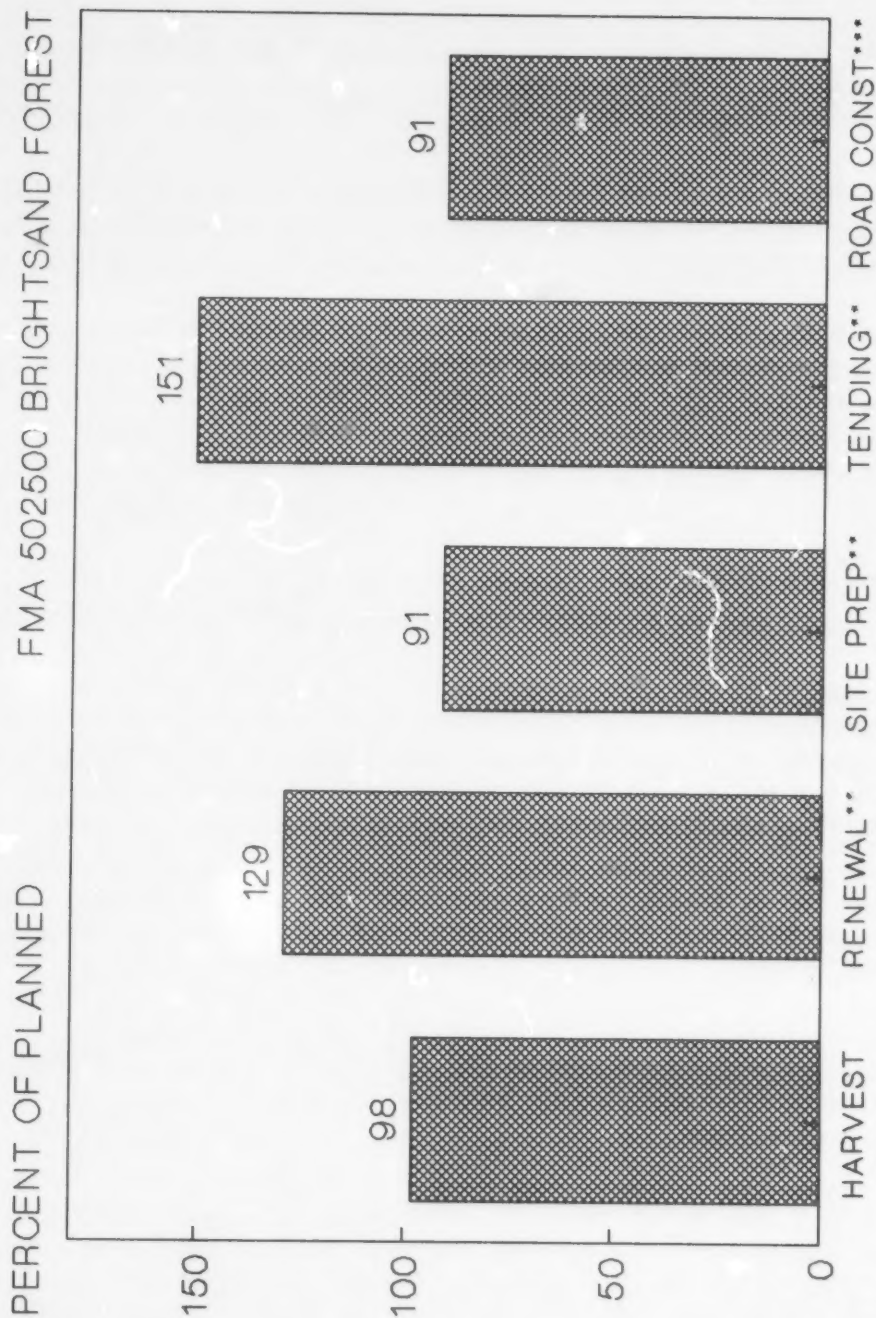
Summary of Company's harvest and forest operation at Ministry expense for 1985-1990

FMA Expenditure and
Accomplishment Report
For The Five-Year Period
1985 - 1990FMA 502500
Brightsand Forest
Canadian Pacific Forest
Products Limited

Activity		AREA (hectares)	COST (dollars)
Harvest		21,273	
Natural Regeneration		45	
Artificial Regeneration	- Planting Bareroot	3	
	- Planting Container	3,066	
	- Seeding Direct	8,570	
	- Seeding With Site Prep	2,174	
	- Scarification	124	
Total Regeneration		13,982	\$ 1,435,499
Retreatment		0	
Site Preparation	- Mechanical	7,860	
Total Site Preparation		7,860	\$ 1,507,723
Tending	- Chemical Cleaning/Aerial	5,218	
Total Tending		5,218	\$ 580,362
TOTAL SILVICULTURAL PAYMENTS			\$ 3,523,584
		(kilometres)	
Road Construction	- Primary	79.7	\$ 2,833,581
	- Secondary	78.5	\$ 1,267,321
Total Road Construction		158.2	\$ 4,100,902
Road Maintenance		240.1	\$ 118,520
TOTAL ROAD PAYMENTS			\$ 4,219,422
TOTAL PAYMENTS			\$ 7,743,006

N.B. This table represents activities carried out by the Company, and the associated costs to MNR

FIGURE 1: COMPARISON OF OPERATING PLAN VS ACTUAL



** 5th year annual report - Table 6.4.1

*** 5th year annual report - Table 6.6

Figure 1 shows that 91% of the planned roads were built. Maintenance carried out amounted to 138% of planned due to an underestimation in planning. Altogether, the Company did a good job of meeting road planning objectives.

There were two major and nine minor and administrative amendments to the operating plan involving the allocated stands for harvest and road location, areas of concern (AOCs) and road construction. The salvage of blowdown and relocation of roads to accommodate other users, the needs of third party operators, and the harvesting of 'oldest first' were the principal reasons for these amendments.

In plan implementation, Figure 1 shows that actual achievement was close to, or exceeded planned levels of achievement for site preparation (91%), forest renewal (129%) and tending (151%). The Company is commended for their work.

In checking planning documents for the period under review, the committee found that planned forest renewal was 50% of the planned area harvested and 66% of the actual area harvested. In the new TMP planned forest renewal is 85% of the planned area harvested, a significant improvement. More detail on this and other accomplishments of the Company will be found in Sections 2.2.2 Conformity of Harvest and Silviculture Operations with the Ground Rules and 3. Maintenance of Productivity.

2.2 THE GROUND RULES

2.2.1 KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

The Company forestry staff are located in the Woods Office in Thunder Bay and at various field locations on four FMAs and other Crown Timber licenses. The review team dealt principally with the staff in Thunder Bay while reviewing the Brightsand Forest. Many of the staff perform specialized functions and were found to be knowledgeable and familiar with the Agreement and ground rules usually pertaining to their area of responsibility and previous positions held.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

Through examination of silvicultural maps and records, field inspections and discussions with both Company and Ministry staff, the review committee has confirmed that harvesting and silvicultural operations were conducted in accordance with the ground rules with the possible exception of shallow sites as discussed below.

The principal method of regeneration used on the Brightsand Forest is mechanical site preparation with ground or aerial seeding for jack pine following clear cutting and full tree logging. This work appears highly successful and during the field trip, out of eleven sites visited, all met, or are expected to meet the specifications of the ground rules. Sites planted to jack pine in the earlier years are successful, but much of the stocking is coming from natural jack pine regeneration. Similar upland sites planted or seeded to black spruce will only be successful with the assistance of natural jack pine seedlings growing on the site prepared areas.

One of the Company concerns in the management of this area is the conversion of mixed stands of overmature spruce and jack pine presently in the spruce working group to the jack pine working group with a very low spruce content. A reduced planting stock allocation has forced the Company to practice extensive silviculture at least during the period under review. This has required the Company to accept low cost jack pine regeneration on these areas and manage the better sites closer to the mill (Dog River - Matawin FMA) for spruce using their limited supplies of planting stock to best advantage. The Company is leaving lowland spruce sites and poplar sites for natural regeneration. The review committee agrees with these decisions in the regeneration of the Brightsand Forest as the best alternative to planting.

In the poplar working group, sites can be chosen before harvest for aspen management without costly regeneration and tending treatments. Through these and other methods, the committee feels that the area naturally regenerated will increase and as a result productivity should be maintained or improved.

Site preparation is mainly done on upland sites using the Bracke, conventional drags, Koehring power heads and disc-trenchers. Mineral Soil Exposure (MSE) is usually adequate and is not normally prescribed or measured. Only one field site visited appeared to have low MSE and poor seeding results, due to a heavy duff layer and debris from the overmature stand. Further action on this site will be dependent on the results of the stocking assessments.

The Company has an active tending program and is to be commended for systematically monitoring and releasing regeneration projects.

As logging progresses, it is evident that there are shallow sites being harvested in the Brightsand Forest. These areas presently being clearcut are difficult and expensive to regenerate, have low productivity and will leave increased areas of unproductive forest in the next rotation.

The Company should review site classes and site potential and develop a treatment strategy suitable to the Ministry under the existing ground rules for the period under review to minimize damage to, and loss of, production from fragile sites. It should be noted that existing ground rules, for the period under review, permit clearcutting only in areas where soil depth will permit planting; otherwise, strip cutting is required.

RECOMMENDATION: That the Company develop a strategy consistent with the ground rules and acceptable to the Ministry to reduce damage to shallow sites and prevent a loss from the production forest land base.

The ground rules permit the classification of non-treatable sites by mutual agreement. While the Company is to be commended for their forest renewal program, they have not declared any area non-treatable in the first five-year period of the Agreement. Although non-treatable areas are presently a very small proportion of the cut-over area on the Brightsand Forest, the committee feels that recognition and reporting of non-treatable sites will contribute to a more accurate forest inventory.

RECOMMENDATION: That 1) the Company review the status of lands cut-over during the five-year term, (1985-1990), for which Table 1 of the ground rules specifies treatment, but which have received no treatment or plan for treatment, and 2) the Company propose areas to be classified as non-treatable to the Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to the preparation of the 1995-2015 TMP.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

The invoicing procedures of the Company were found to be in general conformity with those specified in paragraph 6.0 of the ground rules. The procedure followed does not always result in approval of the invoice and several instances were reported both by the Company and the Ministry of a final invoice being returned for clarification or correction. Hopefully, the new method described in Section 2.6 Company Records, will improve accuracy in invoicing procedures.

2.2.4 PREPARATION OF NEW GROUND RULES

The Forest Management Agreement with the Company requires both parties to commence the preparation of new ground rules for the next five-year term at least eight months prior to the expiry of the old ground rules, and to agree upon those new ground rules on or before that expiry date of March 31, 1990. At the time of this review, the new ground rules were prepared and agreed to by Company and Ministry staff.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS AND WOOD FLOW

According to paragraph 20(1) of the Agreement, the Company has agreed to maintain its harvest in the Brightsand Forest at a level between 90% and 110% of the adjusted maximum allowable depletion (MAD) for each working group in each five-year term. The Company may request the Minister to authorize variations to the levels specified in the Agreement.

Paragraphs 20(3) and 20(4) of the Agreement provide for either a remedy or liquidated damages in the event of an overcut or undercut, respectively, on the area under Agreement. The Agreement holder may avoid liquidated damages through the declaration of timber surplus (paragraph 20(5)) to its needs in an approved management plan; however, liquidated damages do not apply in the first five-year term of a Forest Management Agreement.

Table 2 highlights a potential problem in the spruce working group. During the past five years the 1985-1989 Maximum Allowable Depletion (MAD) was exceeded by 100% (27,424 hectares depleted vs 13,807 hectares allowable) due mainly to a major windthrow and fire. These non-harvest depletions (15,657 hectares) amounted to 54% of the total depletion with windthrow and fire accounting for 45% and reserves the remaining 9%. The impact of the depletion resulting from this major windthrow and fire will be reflected in the 1995-2015 management plan MAD calculations.

TABLE 2

Comparison in hectares, by working groups, of the Maximum Allowable Depletion (MAD) for the period 1985-1990, the non-harvest depletion, the total depletion, the percent of non-harvest to the total depletion, and the MAD for the five year period of 1990-1995.

FMA 502500
Brightsand Forest
Canadian Pacific Forest
Products Limited

Working Group	MAD 1985-1990	Non-Harvest Depletion	Total Depletion	Percent Non-Harvest vs Total Depletion	Renewal Total	MAD 1990-1995
Pine	12,166	5711	13,899	41		10,408
Spruce	13,807	15,657	27,424	57		15,396
Balsam	1,302	935	1,198	78		1,333
Poplar	2,601	1,971	2,646	74		2,318
Birch	1,661	647	1,027	63		1,291
TOTAL	31,537	24,921*	46,194	54	13,982	30,756

* Reserves - 9% of total depletions

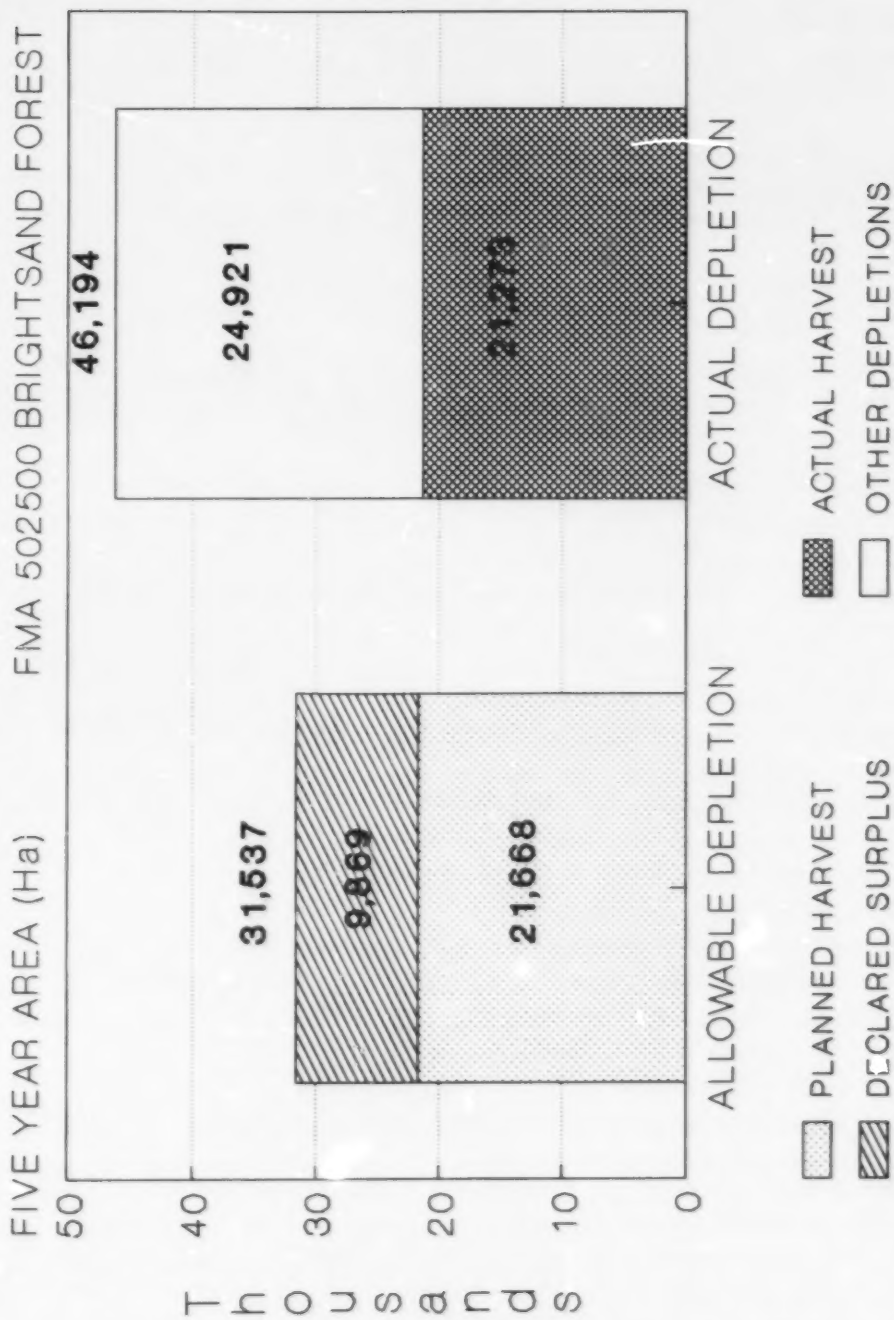
Other (fire, blowdown, etc.) - 45% of total depletions

Figure 2 shows the relationship of the allowable depletion and harvest. The non-harvest depletion exceeded the declared surplus because of large areas of windthrow and fire mainly in spruce stands. Salvage of the windthrown timber has been minimal due to the feasibility of constructing roads for a minimal return of volume. These areas remain as potential fire hazards.

Table 3 verifies that the Company did not meet its harvest obligations of 90% - 110% of the MAD in any of the working groups but did harvest 98% of forecast for all working groups combined. The spruce and balsam working groups exceeded forecast by 18% and 26% respectively as an effort was made to harvest damaged spruce and balsam stands.

Table 4 is a comparison of forecast volume vs the actual volume harvested. The actual versus forecast harvest was 86% by volume and 98% by area. Yields of 143.4 m³/hectare were predicted vs 113.1 m³/hectare actual. Lower yields were the result of a 26% shortfall in the spruce working group and 13% in the balsam due mainly to inaccurate forecasting. Jack pine yields were 3% greater than predicted. These shortfalls in the spruce and balsam working groups illustrate the need for better yield forecasts from up-to-date information. The Company has recognized this need and is currently developing a Geographical Information System (GIS) which will be applied to the Brightsand Forest to ensure that up-to-date information is available when required. The committee commends the Company for this initiative.

FIGURE 2: COMPARISON OF ALLOWABLE DEPLETION AND HARVEST



The Brightsand Forest is comprised mostly of spruce and jack pine stands. The Company has been dependent on the spruce from this FMA to maintain the 90% spruce furnish required for use in the newsprint paper machines. The Company is concerned that the harvested spruce stands are regenerating to jack pine. One of the contributing factors to the reduction in the spruce working group is a lack of spruce planting stock caused by the Ministry planting cap. The Company gives priority for the available planting stock to the Black Sturgeon and Dog River - Matawin FMAs which are closer to the mill. This results in little or no planting stock available to the Brightsand which is currently being regenerated by aerial seeding of jack pine and clearcutting of spruce stands for natural seeding.

The wood flow from this forest is comprised of equal amounts of spruce and jack pine with about 3% balsam. Third parties account for 30% of the conifer harvested from this FMA. A portion of residual pulpwood and chips are returned to the Company. No hardwoods are harvested for manufacturing by either CPFP mills or third parties.

2.4 NSR OBLIGATIONS

Under provision of the Agreement, the Company has an obligation to reforest NSR lands at the rate of 5% of Class 2 and 3 NSR lands annually. This amounts to a total of 213 hectares for the five-year term under review and 851 hectares for the entire twenty-year period of the Agreement. Company tending operations of 5,218 hectares during the five-year period have concentrated on recent cut-overs that have been planted to container stock or aerial seeded to jack pine. No tending was done on NSR 2 or 3 but most of the area (651 hectares) has regenerated to jack pine or poplar stands (Figure 3). The poplar stands are too far advanced to be economically converted to conifer. These 651 hectares have been reclassified as Free-to-Grow (FTG) jack pine or poplar stands, leaving a total of 200 hectares of NSR 2 land remaining to be reforested. While the committee recognizes the excellent tending effort by the Company on the recent cut-over areas, achieving 151% of their objective, it is concerned that Company obligations to reforest NSR 2 and 3 lands under the Agreement have not been met.

RECOMMENDATION: That the Company and the Ministry, as per paragraph 25 of the Agreement, establish a schedule for the review and if required, treatment, of the remaining 200 hectares of NSR land, in the next fifteen-year period (1990-2005). This will ensure that the land is reforested with such species of trees as are compatible with the nature and quality of the NSR lands and the timber required by the Company's mills and plants.

RECOMMENDATION: That the Minister recognize 651 hectares of natural regeneration occurring on previously classified NSR 2 and 3 land, and credit this to the Company's original NSR twenty-year obligation of 851 hectares.

2.5 ROAD CONSTRUCTION AND MAINTENANCE

Paragraph 31 of the Agreement provides for the Minister to reimburse the Company, subject to a maximum amount per kilometre, for the construction, reconstruction, and maintenance of forest access roads on the Agreement area. To be eligible for payment, roads must be included in approved annual plans and constructed according to the standard specified in Schedule "E" of the Agreement.

TABLE 3

Comparison in hectares of the Maximum Allowable Depletion, Forecast Harvest from the Operating Plan and Actual Harvest levels by Working Group for the Period 1985-1990 and the percentage difference between the Forecast Harvest and Actual Harvest.

FMA 502500
Brightsand Forest
Canadian Pacific Forest
Products Limited

	1985-1990 MAD	Declared Surplus	Forecast Harvest	Actual Harvest	% Actual vs Harvest
Pine	12,166		10,218	8,189	80
Spruce	13,807	15	9,962	11,767	118
Balsam	1,302	715	208	263	126
Poplar	2,601	1,835	761	675	89
Birch	1,661	1,325	519	379	73
TOTAL	31,537	3,890	21,668	21,273	98

TABLE 4

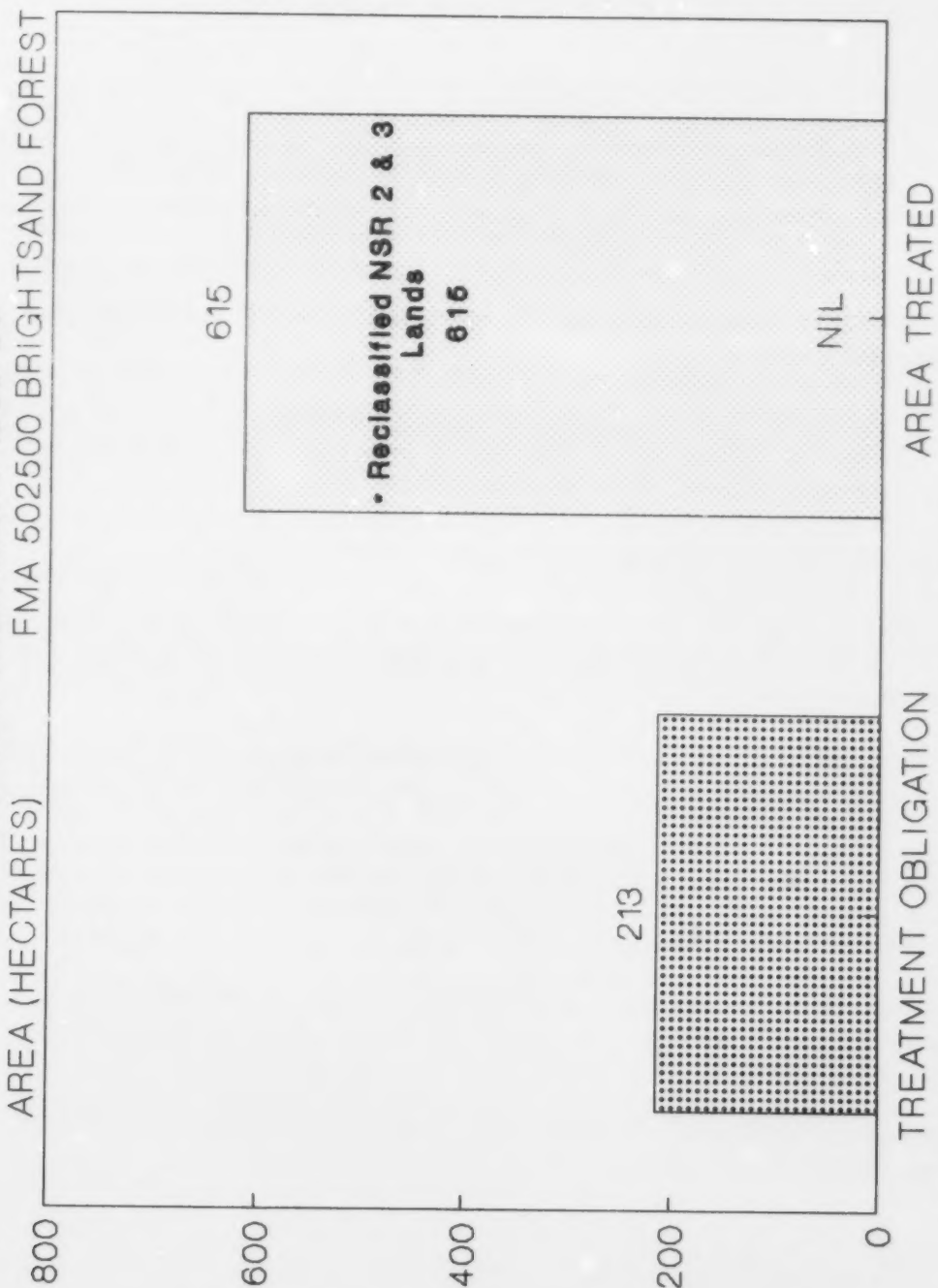
Comparison of forecast and actual volumes in cubic metres (m³) by species and the percentage difference.

FMA 50250
Brightsand Forest
Canadian Pacific Forest
Products Limited

Species	Forecast m ³	Actual m ³	Percent Actual vs Forecast
Spruce	1,522,625	1,124,663	74
Balsam	93,250	81,458	87
Pine	1,168,400	1,200,532	103
Poplar	--	70	
TOTAL	2,784,275	2,406,823	86

The Brightsand Forest was a relatively undeveloped management unit prior to 1985. Although held under licence since 1957, road and camp construction did not begin until 1965. Road construction was directed north from the hamlet of Graham on the C.N.R., and beginning in 1975, south from Savant Lake on the C.N.R. mainline. In total, 135 km of primary road and 187 km of secondary road existed prior to 1985. The Graham Road passes through several portions of Company forests, as well as limits and freehold of other companies, before becoming the main artery of the Brightsand Forest. In the southern portions of the forest, secondary roads were well developed. However, some

**FIGURE 3: COMPARISON OF NSR TREATMENT OBLIGATIONS
AND NSR TREATMENT 1985-90**



• Regenerated naturally to hardwood working group and reclassified as NSR 1. Did not receive treatment.

areas of old forest in the south remained inaccessible and relatively few roads existed in the northern half of the forest. Therefore, access for harvesting required expansion of both primary roads and secondary roads. The main Graham Road was extended 23 km, and the supporting road network extended through much more of the area. During the five-year period, the Company built 80 km of primary road and 78 km of secondary road, as well as maintaining 240 km.

On the Brightsand Forest, all roads receiving payment are built by the Company or third party operators. Roads were to be examined jointly by a Ministry and a Company representative to verify standards and measure lengths. However, on several occasions this verification was not done and the Company has had trouble meeting FMA road construction standards. In one case a portion of the road was not paid for because it did not meet standards. Another portion brought only partial payment.

RECOMMENDATION: That the Company ensure that roads are built to FMA standards prior to inspection and invoicing.

In addition to roads submitted for FMA funding, the Company continues to build substantial mileages at its own expense. For example, during 1989-1990, 17 km of secondary roads were built and 95 km maintained at Company expense. This is primarily due to the shortfall in funding experienced during most years. Funds for road construction and maintenance received annually amounted to about 70% of those requested in Annual Work Schedules over the five-year period.

Many amendments for road location were required during the review period. Some of these were commendable in that they accommodated concerns of other users, but others might have been avoided with better planning.

RECOMMENDATION: That the Company improve the field inspection of prospective road locations prior to submitting plans so that the number of subsequent amendments will be reduced.

2.6 COMPANY RECORDS

The records kept by the Company's Woodlands office for access roads, forest depletion and silvicultural projects were examined by the review team. FMA road data is filed together with maps and invoices in field folders. An overview map of the Forest (Scale 1:63680) is kept for ready reference. Annual harvest and depletion records are compiled by age class and working group on permanent depletion maps (Scale 1:15,840), colour coded for each category of depletion. Depletion data is summarized in the annual report.

The review team was advised that the Ontario Wood Supply Forest Productivity (OWOSFOP) model database is updated periodically to ensure that total depletion is reflected in the five-year MAD calculations. There is some misunderstanding between Company and Ministry foresters regarding the land base used in MAD calculations, particularly in the spruce working group. They are presently working together to resolve this problem.

Silvicultural project data is sent by the camp forester to the DCR for verification of the area treated and work performed. When this is agreed to, it is returned to the camp forester who submits the data to the Woods Office to be plotted on mylar planimetric maps and filed by half base map. Silviculture cards are filed by base map and FMA. The project data is entered into the computer which produces the invoices for silviculture payment and various summaries for annual reports and other Company needs.

Company maps are to be digitized and a program is being prepared this year so that silvicultural data can be entered directly onto the map and area generated. The Company expects this to be operational during the 1990 - 1995 term and are commended for their progressive approach in adopting this new technology.

Silvicultural assessment and stocking records are maintained by the Company to the Free-to-Grow stage. All data entry, calculations and reports are computerized under the Company assessment system.

The review committee was favourably impressed by the maps and data produced by the Company. However, in working with the reports and summaries of the data used in annual reports and produced for the five-year review, many small discrepancies were found causing tables to be revised. Some annual report tables were used in this review, but others had to be reworked.

2.7 ANNUAL REPORTS

Paragraph 38 of the Agreement requires that the holder prepare an annual report in accordance with the TMP, summarizing certain aspects of operations during the preceding year.

The annual report of Company operations on the Brightsand Forest is submitted as a silviculture report, as specified in the Agreement, with a separate depletion report, on November 15. No record is kept of when they are submitted by the Company or received by the Ministry; however, both agree that date of submission has not been a problem. The reports themselves consist only of the specified tables with no written statements of problems, highlights including an explanation of target achievements, amendments or other significant happenings in the year. These would be most useful in the preparation of the report of past operations for the next timber management plan and for the five-year review.

RECOMMENDATION: That annual reports include a descriptive section to report the year's highlights including an explanation of target achievements, amendments and other significant events. Submission dates of all annual reports are to be recorded.

Silvicultural reports of site preparation and aerial seeding checked by team members using a dot grid and a pneumonics graphic calculator were, for the most part, accurate within 4%. The record system permits maintenance of accurate records for silvicultural work within the capabilities of current technology. A GIS currently being implemented should prove even more accurate and convenient.

Road invoices for three years were checked against the annual reports. In one report, mileage was included for three roads reported the previous year.

RECOMMENDATION: That the Company 1) submit accurate reports and that the Ministry verify the completeness and accuracy of the data in each annual report in the 1990-1995 period for the Brightsand Forest, and 2) ensure that five-year summaries for the ten-year FMA review in 1995 agree with data from the annual reports.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 9 of the ground rules, entitled Modified Management Areas (now Areas of Concern, AOCs) explains how the Ministry, in consultation with the Company, will identify and delineate on FRI Forest Stand Maps during the preparation of each five-year operating plan areas to be managed to meet objectives other than those of wood fibre production. It states that some form of harvesting and regeneration is intended in these areas where possible. The Minister and the Company recognize two types of AOCs (1) linear-along roads and waterways, and (2) non-linear for wildlife protection, (e.g. moose habitat, heron rookeries).

This aspect of the Agreement was elaborated in Sections 7.13, 7.14, and 12 of the draft Management Plan. Four management strategies were listed: public consultation, areas of concern, exclusion of areas from the productive forest, and road access planning. Three categories of fish and wildlife management prescriptions were listed: modifications to routine timber harvesting practices, application of timber reserves, and management of road location and road use for access control. Accommodation of other users was enlarged on even further in the operating plan with a complete listing of AOCs and their prescriptions.

The implementation of these sections of the plans has been as good as the planning. With 35-40 outfitters operating in the Brightsand Forest area, location of new roads was of prime importance, especially for the high proportion of outfitters catering to wilderness fishing and hunting. Due to concerns of these people, the Brightsand Road was relocated, several other road locations were altered, and a proposed connection to an existing road was not completed. In attempting to accommodate all these people, Company personnel flew out to their places of business and met them personally. Due to the good relations established between the Company and the outfitters further possible conflicts were averted. For example, several outfitters reported to the Company the times they were most heavily booked (usually about three weeks of spring fishing) and the Company was able to move operations to other areas during these periods. The Company is to be highly commended for their sensitive response to the needs of these other users.

At the same time, the Company has attempted to respond to other user groups with different outlooks. A petition was received asking that roads be kept open. Outfitters near Allenwater do not want access, but residents do. The Ignace Economic Development Committee and Town Council objected to a road connection that would have meant cheaper hauling because it would also divert business from their town. The Company and the Ministry have accommodated these diverse interest as much as possible.

Few cottagers use the Brightsand Forest. Trappers usually appreciate additional access. Mining claims have been staked in the Savant Lake area as well as other areas, but no conflicts have developed.

Few eagles or ospreys nest in this forest area. Two heron rookeries have been identified. Application of the moose habitat guidelines has changed the landscape dramatically in favour of these animals by reducing and spacing cut-over areas, and by leaving corridors and other shelter. The result is more pleasing to the eye of humans and more hospitable to moose. In the northern section of the Brightsand Forest the moose guidelines have been applied less rigorously. Clearcut sizes in two areas examined during the field investigation exceeded present guidelines. The justification for this move in the plan included the observations that these areas were largely monocultures supporting few moose at the present time, and with such poor soils that they would be unlikely to support high densities in the future. This may be a reasonable interpretation of the guidelines for this area, but does not address the Ministry claim that providing for moose habitat also provides for other forest wildlife. The committee would not like to see this practice become general.

Fishery values in the Brightsand Forest have been protected by establishing AOCs where deemed necessary by fishery biologists. The guidelines have thus been applied flexibly and reasonably. The Company experienced some difficulties with silting of spawning areas during culvert installation, but all culverts examined in the field were well placed and stabilized. More care should be taken during installation in future.

Altogether, other users of the Brightsand Forest have been looked after in a most commendable way.

RECOMMENDATION: That the Company address the specific water crossing problems that are of concern to the Ministry.

3. MAINTENANCE OF PRODUCTIVITY

Table 2 shows the MAD, which was calculated for the Brightsand FMA for the five-year term, to be 31,537 hectares for all working groups. It shows that total depletions (46,194 hectares) exceeded the MAD by 14,657 hectares, a 46% overrun. This over depletion occurred mainly in the spruce working group (93%) as a result of large windthrows and fire during the five-year term.

Renewal treatments were conducted on 13,982 hectares, 66% of the area harvested during the five-year term. The Brightsand Forest harvested areas are being regenerated by clear cutting with natural seeding for spruce regeneration and aerial seeding for jack pine renewal. Stands that contained a moderate amount of aspen prior to harvesting are reverting to the poplar working group. Modified cutting in strips or blocks was used prior to the FMA signing and judging from areas viewed on the field trip, regeneration has been successful. While some container spruce was planted in the first few years, as a result of the Ministry's cap on the amount of planting stock produced, all spruce stock is currently being directed to other Company FMAs and upland spruce stands are regenerating to jack pine. While this will help to maintain productivity of the area, the reduction of spruce stands in the future is not compatible with the present Company requirement of 90% spruce for newsprint production.

RECOMMENDATION: That the Company and the Ministry study the long term economic effects of reduced spruce volumes to the Company's newsprint mill compared to the

regenerating costs required to maintain its present annual volume. A decision based on this study should be available for use in the preparation of the new TMP scheduled for implementation April 1, 1995.

The spruce working group as currently identified in the forest inventory is made up of upland and lowland sites. The upland sites are the most productive, contain the largest trees and are the easiest to harvest. The committee believes that a large proportion of the 100% overdepletion mentioned in Section 2.3 came from upland spruce sites on the Brightsand Forest. These sites are being artificially regenerated to other species or left as unassisted natural regeneration.

The lowland spruce sites are less productive and much of the area is characterized by dense stands of small trees classified Site Class III, too small to harvest and by-passed by current Company operations. These stands represent an overestimation of inventory and an expanded MAD of unknown magnitude. In addition, those lowland sites that are harvested are being left as unassisted natural regeneration.

Prior to the FMA the Company co-operated with the Ministry in modified harvest cutting (strip block and group seed trees) on lowland spruce sites with some success. Since 1985, the Company has ceased modified harvest cutting and relies on clear cutting and unassisted natural regeneration for all spruce lowlands. At the same time, they have reduced the spruce rotation age in the 1990-1995 TMP from 100 years to 90 years. The committee feels that these measures are completely inadequate to maintain the productivity of lowland sites in the current spruce working group.

RECOMMENDATION: That the Company and Ministry review management of the spruce working group with the intention of dividing the existing working group into more than one forest unit, each with its own rotation age and management prescription. This will permit a more realistic calculation of the spruce MAD to be used in the preparation of the new TMP scheduled for implementation on April 1, 1995.

In general, the Company is having good success in regenerating jack pine on the Brightsand Forest. Aerial seeding, especially on tree length logged jack pine stands, is often too successful and thinning may be required in future years. The Company has done some experimenting to correct this overcrowding problem, but no sound forest management prescriptions have been developed.

RECOMMENDATION: That the Company and Ministry review existing data and literature on aerial seeding, and if necessary enter into a co-operative aerial seeding experiment relating sites, mineral soil exposure (MSE), and residual seed sources to jack pine seed required per hectare. The objective of the experiment is to develop a silvicultural prescription to regenerate jack pine stands with adequate spacing and good stocking, while preventing the need for thinning these stands in future years.

To further address long-term productivity, the Company has entered into a co-operative tree improvement and seed orchard project with the Ministry and other companies in the area.

4. COMPANY CONCERNS

The Company was provided an opportunity to express any concerns regarding FMA 502500 or the Ministry's administration of the Agreement. The following are the concerns expressed by Canadian Pacific Forest Products Limited:

- i) Currently one District Crown Representative (DCR) administers three FMAs with Ministry technicians responsible for most field problems. In addition there have been four DCRs in the past five years. These factors have resulted in a lack of continuity and professional evaluations as well as poor communications causing misunderstandings and substandard performance in the administration of this FMA.
- ii) The tree planting cap has resulted in harvested areas remaining untreated, black spruce sites being converted to jack pine, and the inability to regenerate decadent balsam stands. In addition, aerial seeding of jack pine, while less expensive in the short term, may require expensive tending treatments in future years.
- iii) Other concerns are as follows:
 - a need for more and smaller prescribed burns.
 - MNR budget requirements and Annual Work Schedules (AWS) are not compatible.
 - the inability to move funding, eg. planting to tending, between FMA's.
 - the duplication of work required for herbicide applications to both the MNR & MOE rather than one agency.
 - the silvicultural and road construction work is normally not completed in time for AWS November 30th submission. January 1st submission is requested.
 - FRI maps are not detailed enough to meet current planning requirements.
 - other users such as tourism, mining and general recreation do not pay a fair share of forest usage.
 - a regional tree planting rate is preferred to an average provincial rate.

5. CONCLUSIONS AND RECOMMENDATIONS

The review committee was satisfied that the obligations for the Company under the Agreement have been satisfactorily performed during the five-year term under review. Regeneration targets on the Brightsand Forest have been met, but they fell well short of the area harvested and do not adequately address the long term requirements for spruce. The committee is concerned about two problems: 1) the long standing poor communications and co-operation between the Company and the Ministry and 2) the management of the spruce working group on the Brightsand Forest.

The communication problem has been aggravated by a very heavy work load and restrictive limits for both parties, coupled with a shortage of professional staff. The Company and Ministry may wish to review their manpower requirements in view of the increased demands in the forest management planning process.

The management of the spruce working group is of concern as the newsprint mill currently relies on 90% spruce content to maintain the quality required to compete in the world newsprint markets. The MAD for the spruce working group is gradually being reduced as upland spruce stands are being converted to jack pine through natural or artificial seeding. The Ministry planting cap is a contributing factor to this conversion problem. The committee suggests that a co-operative study as to mill requirements and availability of spruce, is required in order that both parties can agree on a spruce management strategy for sustained yield.

The committee was impressed by the Company's communication with other users and consideration of their needs. We commend the Company for their commitment to multiple land use.

The following are the committee's recommendations:

RECOMMENDATION NO. 1: That the Minister extend the remaining period of FMA 502500 by a further term of five consecutive years to March 31, 2010.

RECOMMENDATION NO. 2: That the Company and the Ministry resolve the long standing problems delaying the completion and approval of the plans required under the Forest Management Agreement for the Brightsand Forest to ensure that future plans conform to the schedule specified in Sections 6 to 11 of the Agreement.

RECOMMENDATION NO. 3: That the Company develop a strategy consistent with the ground rules and acceptable to the Ministry to reduce damage to shallow sites and prevent a loss from the production forest land base.

RECOMMENDATION NO. 4: That 1) the Company review the status of lands cut-over during the five-year term, (1985-1990) for which Table 1 of the ground rules specifies treatment, but which have received no treatment or plan for treatment; and 2) the Company propose areas to be classified as non-treatable to the Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to the preparation of the 1995-2015 TMP.

RECOMMENDATION NO. 5: That the Company and the Ministry, as per paragraph 25 of the Agreement, establish a schedule for the treatment of the remaining 200 hectares of NSR land, in the fifteen-year period (1990-2005). This will ensure that the land is reforested with such species of trees as are compatible with the nature and quality of the NSR lands and the timber required by the Company's mills and plants.

RECOMMENDATION NO. 6: That the Minister recognize 651 hectares of natural regeneration occurring on previously classified NSR 2 and 3 land, and credit this to the Company's original NSR 20 year obligation of 851 hectares.

RECOMMENDATION NO. 7: That the Company ensure that roads are built to FMA standards prior to inspection and invoicing.

RECOMMENDATION NO. 8: That the Company improve the field inspection of prospective road locations prior to submitting plans, so that the number of subsequent amendments will be reduced.

RECOMMENDATION NO. 9: That annual reports include a descriptive section to report the year's highlights including an explanation of target achievements, amendments, and other significant events. Submission dates of all annual reports are to be recorded.

RECOMMENDATION NO. 10: That the Company: 1) submit accurate reports and that the Ministry verify the completeness and accuracy of the data in each annual report in the 1990-1995 period for the Brightsand Forest, and 2) ensure that five-year summaries for the ten-year FMA review in 1995 agree with data from the annual reports.

RECOMMENDATION NO. 11: That the Company address the specific water crossing problems that are of concern to the Ministry.

RECOMMENDATION NO. 12: That the Company and the Ministry study the long term economic effects of reduced spruce volumes to the Company's newsprint mill compared to the regenerating costs to maintain its present annual volume. A decision based on this study should be available for use in the preparation of the new TMP scheduled for implementation on April 1, 1995.

RECOMMENDATION No. 13: That the Company and the Ministry review management of the spruce working group with the intention of dividing the existing working group into more than one forest unit, each with its own rotation age and management prescription. This will permit a more realistic calculation of the spruce MAD to be used in the preparation of the new TMP scheduled for implementation April 1, 1995.

RECOMMENDATION NO. 14: That the Company and Ministry review existing data and literature on aerial seeding, and if necessary enter into a co-operative aerial seeding experiment relating sites, mineral soil exposure (MSE), and residual seed sources to jack pine seed required per hectare. The objective of the experiment is to develop a silvicultural prescription to regenerate jack pine stands with adequate spacing and good stocking, while preventing the need for thinning these stands in future years.

FIVE YEAR REVIEW
KIMBERLY-CLARK CANADA INC.

NAKINA FOREST
FMA 502600

1985-1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Ministry of Natural Resources (the "Ministry") and Kimberly-Clark Canada Inc. (the "Company") signed a Forest Management Agreement or FMA (the "Agreement") for the Nakina Forest, located north of Nakina, on June 13, 1985. The purpose of this Agreement was to provide for a continuous supply of forest products for the Company's wood processing plants at Longlac and Terrace Bay, Ontario, and to ensure that the forests of the Nakina Forest are harvested and regenerated to produce successive crops of timber on a sustained yield basis.

This review of the first five consecutive years of the Agreement was conducted in the Nakina Forest to determine whether the obligations of the Company under the Agreement have been satisfactorily performed and to recommend to the Minister of Natural Resources whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of three engaged by the Ministry of Natural Resources for this purpose. The members were as follows:

- Mr. C.J. Heeney, B.Sc.F., Dip. R.M.,
Supervisor, Forest Production and Control (Retired),
Ministry of Natural Resources,
Committee Chairman
- Mr. G.W. Bell, B.Sc.F., R.P.F.,
Vice-President Woodlands (Retired),
Spruce Falls Power and Paper Company Ltd.
- Ms. K.J. Szuba, B.Sc.F., Ph.D.,
Consulting Biologist

1.3 TASKS OF THE REVIEW COMMITTEE

The review committee's assignment was to undertake a fair and objective review of Kimberly-Clark Canada Inc.'s performance on the Nakina Forest during the first five-year term vis-a-vis their obligations under Forest Management Agreement 502600 and to make recommendations to the Minister of Natural Resources on the extension of the Agreement's term according to the "Evergreen" section of the Agreement (i.e., Section 15, paragraph 33).

The review was conducted by:

- examining the management, operating and annual plans, and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural and access road records for adequacy and for conformity with the management plans and the ground rules of the agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provisions of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects, and road construction typical of the techniques employed in the forest for conformity with the Agreement holder's records and for field application of the ground rules, and
- determining the degree to which other forest users and other forest values were accommodated in timber management planning and field operations,
- meeting with Company and Ministry district staff to identify problem areas and Agreement concerns on the part of either party.

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION AND SUBMISSION OF PLANS

Paragraphs 6(1), 10(1), 11(1), and 15(1) of the Agreement require the Company to prepare management and operating plans and a series of annual plans. These plans must be prepared and submitted according to the time frame specified in the Agreement and according to the manual that has been approved by the Minister for this purpose.

The Forest Management Agreement for the Nakina Forest was signed on June 13, 1985. Initially the Company and the Ministry agreed that the management and operating plans would be submitted by October 1985. The October 1st submission date was not attainable and the Company requested a series of extensions to June 13, 1986. Subsequently, a final extension to August 15, 1986 was negotiated and the Company submitted the management plan by this date. The plan was not accepted by the Ministry. The specific concern was the over allocation of upland spruce in the Longlac Forest but this delayed the approval of the Nakina plan. Following discussion with the Ministry, it was agreed to split the spruce working group into site classes X, 1, and 2 into upland and lowland forest units. It was also agreed to further divide the spruce group into three units with separate rotation ages for the 1990-1995 Timber Management Plan (TMP). The plan was approved by the Ministry on March 11, 1988.

The operating plan for the five-year period (1985-1990) was due on December 13, 1985. An extension to February 13, 1986 was granted by the Ministry and the plan was completed and submitted on February 25, 1986. After review by the Ministry, the plan was returned to the Company

for revision. The plan was resubmitted on August 15, 1986, approved on March 13, 1987, and underwent public inspection during April 1987.

The first annual plan (1985-1986), now called the Annual Work Schedule or AWS was not submitted until January 24, 1985, nor was it approved by the Ministry until April 22, 1985. Subsequent AWSs were generally submitted and approved on time.

These plans include Company operations for 82% of the volume to be harvested and third party commitments to Weldwood of Canada (14%) and Northern Wood Preservers (4%).

The TMP for the Nakina Forest for the second five-year term (1990-1995) has been prepared in accordance with the Timber Management Planning Manual for Crown Lands in Ontario (1986). The document was prepared on time and was approved on February 22, 1990.

In conclusion, for the period under review, the Company has prepared the required plans on time and has shown an ability to successfully resolve planning issues with the Ministry and other forest users.

2.1.2 PLAN IMPLEMENTATION

The Company is required, under the Forest Management Agreement, to conduct all forestry operations in accordance with approved management, operating and annual plans. The accomplishments of the Company in silvicultural operations and road construction are shown in Table 1.

More detail on the silvicultural accomplishments of the Company will be found in Section 2.2.2.

The review committee examined the Company planning documents and performance records supplemented by ground inspections, for harvest cut, road construction and silvicultural operations. For silvicultural activities, the actual achievement was just over 50% of the planned levels as shown in Figure 1. This reduced activity on the Nakina Forest was largely due to an underestimation of yield which caused the over-allocation of stands. The closing of the Company's sawmill in Longlac in 1987 and an increase of purchased wood used in the Terrace Bay mill also contributed to the reduced activity.

Figure 1 shows that the Company harvested 43% of the area approved for harvest and that the area of forest renewal was 54% of the area planned for forest renewal. The 1985-1990 operating plan outlined a forest renewal program of 10,681 ha and a planned harvest area of 21,180 ha indicating that 50% of the harvest area was planned for renewal. The actual forest renewal of 5,735 ha was 63% of the 9,127 ha of actual harvest. This was a significant improvement over the plan but still below the regeneration needed to sustain a productive forest. More detail on this variance is provided in Section 2.3.

Table 1

Summary of Company Forest Operations with Ministry Funding

FMA Expenditure and
Accomplishment Report
for the Five-Year Term
1985-1990

FMA 502600
Nakina Forest
Kimberly Clark Canada Inc.

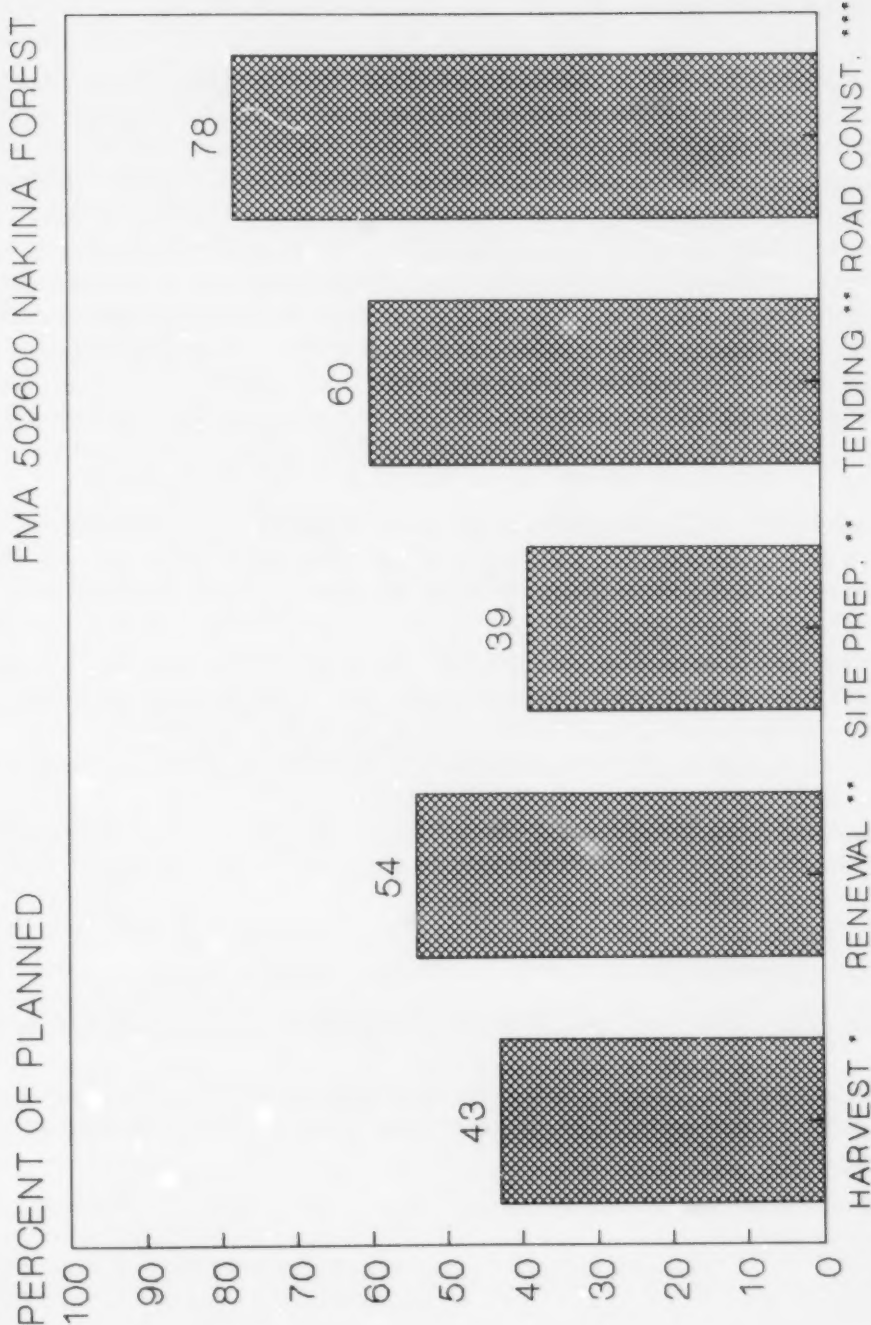
ACTIVITY	AREA (hectares)	COST (dollars)
Harvest	9,127	
Natural Regeneration	1,163	
Artificial Regeneration - Planting Bareroot	873	
- Planting Container	600	
- Seeding - Direct (2 appl. of 362 ha)	362	
Total Regeneration	2,998	\$ 555,955
Retreatment	0	
Site Preparation - Mechanical	2,520	
- Chemical	181	
Total Site Preparation	2,701	\$ 723,206
Other Costs (Chemicals, Stock Delivery)		\$ 161,201
Tending - Aerial	2,870	\$ 118,442
Total Silvicultural Payments		\$ 1,558,804
	(kilometres)	
Road Construction - Primary	75.3	
- Secondary	27.6	
Total Road Construction	102.9	\$ 3,646,523
Road Maintenance	219.7	\$ 108,202
TOTAL ROAD PAYMENTS		\$ 3,754,725
TOTAL PAYMENTS		\$ 5,313,529

NOTE: Forest management activities were also conducted by MNR at additional expense as part of the MNR obligation under the agreement.

Data Sources:	Harvest Cut	- Table 4.1 (4 yrs act. 1 yr est)
	Nat. Regen.	- Table 6.4.2 (5 yr summary)
	Renewal	- Table 4.4.1.4 (5 yr summary)
	Renewal \$	- Table 6.4.3 (5 yr summary)
	Roads	- 5 yr. summary attachment #5

FIGURE 1: COMPARISON OF OPERATING PLAN VS ACTUAL

FMA 502600 NAKINA FOREST



Data Source:

* Harvest: Table 4.1 (4 yrs actual and 1 yr estimate)

** Table 4.4.3.4 and 6.4.2

*** Table 6.6 and 4.4

The committee was advised that, in the new TMP planned forest, renewal is 13,800 ha or 65% of the 21,361 ha planned for harvest. This is the same level as was achieved in the past five years and reflects the level of forest management that can be achieved by the Company under Ministry funding constraints and using existing technology. Much of the remaining 35% will regenerate to poor quality hardwood stands. This may have a negative impact on future woodflow levels from the Forest.

The road location (see Section 2.5) and harvest cut records of the Company generally conform to the area allocated for harvest and the road locations specified in the planning documents. Except for one case, planned and actual locations of funded primary and secondary roads were the same. The committee checked this by superimposing maps (scale 1:63,360) from the 1985-1990 operating plan (planned locations) onto corresponding mylar maps which showed the final road locations. These final locations corresponded exactly to those illustrated on 1:15,840 scale maps which accompanied the invoices. None of the planned and actual road locations appeared to differ by more than 300 m anywhere along their length, except for 4.8 km of the Poverty Lake Road which was not included in the operating plan or covered by an amendment to it. The Company explained that an amendment was not required because this secondary road was included in an appropriate AWS. It was located in an area allocated and approved in the operating plan, and there were no associated concerns expressed over the allocation during the public review of the plans.

Road construction averaged 78% of the planned amount for 1985-1990 (see Figure 1). Achievement for primary roads (84% of planned) was greater than for secondary roads (65% of planned). The shortfall in road construction reflected changes in the area of harvesting operations.

There were a total of five minor amendments and five administrative amendments to the operating plan. The Ministry introduced two minor amendments to cover a total of fifty six new Areas of Concern (AOCs; formerly called Modified Management Areas or MMAs). Prescriptions for these AOCs were designed to protect attributes of moose and fisheries habitats. Three amendments permitted Weldwood of Canada to harvest residual poplar in previously depleted areas. Three additional amendments exchanged allocated stands for more accessible ones. Another one was a Weldwood road location change, and the last added a small stand to the allocation.

2.2 THE GROUND RULES

2.2.1 KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

Based on discussions with the Company both in the Longlac Forestry office and in the field, it was apparent to the review committee that Company staff were familiar with the provisions of the ground rules and the Agreement.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

Through examination of depletion and silviculture records, field inspections, and discussions with both Company and Ministry staff, the review committee has confirmed that harvesting and silviculture operations were conducted in accordance with the ground rules.

Company harvesting operations were conducted by two commuter operations both of which are conventional cut and skid operations. Both are scheduled to be converted to mechanical harvesting commuter operations in the 1990-1995 period. One third party operation was conducted by Weldwood; Northern Wood Preservers did not operate.

On upland sites the principal silvicultural activity is tree planting of black spruce, jack pine, and white spruce, both bareroot and container stock. During the field trip, eleven planting projects of varying age were visited and the committee was favourably impressed by the quality of work and plantation success. The committee was shown one 1990 plantation using very large black spruce bareroot stock (1 1/2-2 1/2) with huge, multiple tops (2-7 leaders) which will be very slow and difficult to bring through the competition to a Free-to-Grow (FTG) state. The Company indicated that periodic poor stock quality had also been a problem in 1985-1990.

In the period under review, 80% of the site preparation was done mechanically with the remaining 20% split between chemical and prescribed burns (PBs). Mechanical site preparation consisted of the use of barrels and chains, TTS disc trencher, and the Donaren powered disc-trencher on upland sites, and mechanical full-tree harvesting or shear blading on lowland spruce sites. The Company is presently experimenting with a Waddell scarifier manufactured in Sweden in an effort to upgrade the quality of mineral soil exposure, especially in the more difficult rocky and deep duff sites. Excellent results using the herbicide "Vision" were observed on two of the sites visited. When used in combination with mechanical harvesting on selected sites, Vision may provide a means of reducing site preparation costs and early competition in plantations. Although no PBs were visited, both Company and Ministry foresters were well pleased by previous PBs and look forward to treating 750 ha in the 1990-1995 plan period.

Stand tending is essential for the successful establishment of conifer plantations in the Nakina Forest. Competition from aspen, raspberry, shrubs, and grass was visible to some degree on all sites visited. The Company is working hard to monitor plantations and provide aerial tending at the appropriate time. Four plantations visited were ocularly judged to be suppressed and in need of tending; three are planned for release in 1991 and the fourth will be reassessed this year. Some of these plantations will require more than one aerial tending to ensure Free-to-Grow status. Additional herbicide application is required for chemical site preparation and tending natural conifer regeneration. Tending viewed from the air showed mainly good results with some banding on areas missed in the application of the chemical. The Committee is of the opinion that the competition control program will have to be significantly increased in the next five years to ensure the success of artificial regeneration on the competitive sites being treated on the Nakina Forest.

Little aerial seeding was done in the review period, no sites were visited, and few candidate areas were seen. However, with the shortage of planting stock and the relatively poor natural aspen regeneration on many of the drier, coarse-textured sites, seeding may deserve another look. A review of jack pine seeding in relation to careful site selection using the new Forest Ecosystem Classification

(FEC) for northwestern Ontario could result in a successful increase in seeding, thus releasing planting stock for other sites.

The Company is relying on natural regeneration in the Nakina Forest to regenerate roughly 50% of their annual harvest area, mainly in the poplar, birch, and lowland spruce forest units. However, at the time of this review only 1,180 hectares of the 4,555 hectares left for natural regeneration had been declared renewed. Seven sites left for natural regeneration were visited on the field trip. Two were successful natural regeneration of spruce lowlands. Five of the sites were left for natural poplar regeneration. They were mainly on coarser and drier, relatively poor aspen sites and the regeneration was not thrifty or vigorous, although it may reach the required 70% stocking for the fifth year assessment. Several examples were seen where similar sites were planted to jack pine with good success; the aspen competition is easily controlled by tending with Vision.

With FMA planting stock and funding constraints, the Company is to be congratulated for prescribing natural aspen regeneration on suitable sites. However, they will have to improve their ability to identify aspen site quality and make aspen management prescriptions. The new FEC for northwestern Ontario will assist Company foresters to better identify all forest sites and develop prescriptions for specific sites to ensure good quality aspen on sites left for natural regeneration.

RECOMMENDATION: That the Company provide the opportunity for key staff to upgrade poplar management skills using the Forest Ecosystem Classification, poplar silvicultural publications, and training arranged through the Technology Development Unit in Thunder Bay.

The ground rules permit the classification of non-treatable sites by mutual agreement. While the Company is commended for their forest renewal program, they have not declared any area non-treatable in the first five-year period of the Agreement. This has permitted time for the Company to observe what happens on these types of sites. Although non-treatable areas are presently a very small proportion of the cut-over area on the Nakina Forest, the committee believes that recognition and reporting of non-treatable sites will contribute to a more accurate forest inventory.

RECOMMENDATION: That 1) the Company review the status of lands cut-over during the five-year term for which Table 1 of the ground rules specifies treatment but which have received no treatment, and 2) the Company propose areas to be classified non-treatable to the Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to preparation of the 1995-2015 TMP.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

The invoicing procedures of the Company were found to be in general conformity with those specified in paragraph 10 of the ground rules.

2.2.4 PREPARATION OF NEW GROUND RULES

The Forest Management Agreement with the Company requires both parties to commence the preparation of new ground rules for the next five-year term at least eight months prior to the expiry of the old ground rules, and to agree upon those new ground rules on or before the expiry date of March 31, 1990. At the time of this review, the new ground rules were prepared and agreed to by Company and Ministry staff.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS AND WOOD FLOW

According to paragraph 20(1) of the Agreement, the Company has agreed to maintain their harvest from the Nakina Forest at a level between 90% and 110% of the adjusted maximum allowable depletion (MAD) for each working group in each five-year term. The Company may request the Minister to authorize variations to the levels specified in the Agreement.

Paragraphs 20(3) and 20(4) of the Agreement provide for either a remedy or liquidated damages in the event of an overcut or undercut, respectively, on the area under agreement. The Agreement holder may avoid liquidated damages through the declaration of timber surplus to its needs in an approved management plan (paragraph 20(5)); however, liquidated damages do not apply in the first five-year term of a Forest Management Agreement.

Table 2 shows that an area equal to 63% of the area harvested has been renewed. Supporting documents showed that one-fifth of the renewal was reported as natural regeneration. The remaining 37% was comprised of roads and landings, NSR lands planned for prescribed burns which were not executed, and hardwood working groups left to regenerate naturally. The prescribed burn areas are scheduled for treatment in the next five-year period.

Table 3 indicates that only 43% of the forecast harvest was cut and that the birch working group was the only forest unit where the Company achieved the 90%-110% objective. Figure 2 shows a comparison of allowable and actual depletions for all working groups combined. There are three reasons for not harvesting the forecast area allocation: 1) the Company under-estimated planned yields by 59% and 89% for conifer and poplar, respectively, mainly because by-pass areas were included in the depletions for the historical yield calculations used in forecasting 1985-1990 area allocations; 2) the shutdown of the Longlac sawmill in 1987 and the failure of Northern Wood Preservers to use allocated wood resulted in a 20% reduction in the use of allocated wood during the five-year period; and 3) the increase in purchased wood, stimulated through lost production by labour disputes, replaced wood planned for delivery from the Nakina Forest.

Tables 3 and 4 show that 64% of the volume forecast was produced from 43% of the area allocated due to the under-estimation of yield.

Table 5 illustrates the large over-run in actual volume for the 1985-1990 period, but shows that a realistic yield for conifer is forecast for the 1990-1995 period. The forecast yield for poplar is much lower than the 1985-1990 actual yield as the poplar stands remaining on the Nakina Forest are reported to be of very poor quality.

TABLE 2

Comparison in Hectares, by Working Group, of the Maximum Allowable Depletion (MAD) for the period 1985-1990, the Total Depletion, Actual Harvest, Renewal, Percent Renewal, and the MAD for 1990-1995.

FMA 502600
Nakina Forest
Kimberly - Clark Canada Inc.

Working Group	1985-1990 MAD	Total Depletion	Actual Harvest	Renewal	Percent Renewal	1990-1995 MAD
Spruce x, 1, 2	33,850	6,251	4,736	3,128	66	14,897
Spruce 3	13,220	793	457	122	27	3,477
Jack Pine	7,955	1,808	1,466	1,427	97	2,845
Balsam Fir	4,537	262	211	9	4	717
Poplar	12,004	3,829	2,114	1,049	50	3,441
Birch	2,429	160	143	0	0	486
Total	73,995	13,103	9,127	5,735	63	25,863

Data Source:

MAD 1985-90	- Table 2.7 Operating Plan
Total Depletions and Actual Harvest	- Table 4.1, 5 yr summaries (4 yrs actual, 1 yr est.)
Renewal	- Tables 4.4.3.4, 6.4.2 (5 yr summaries)
1990-1995 MAD	- Table 4.14, 1990-1995 TMP

Wood flow of conifer and poplar from the Nakina Forest in the five-year period was to Kimberly-Clark's pulp mill in Terrace Bay, a haul distance of 192 km, and 82,000 cubic metres of poplar to the Weldwood waferboard and plywood plant at Longlac. Conifer produced on Weldwood's harvesting operation was sold to Kimberly-Clark on a first right of refusal basis or was sold to local sawmills.

RECOMMENDATION: That in the event the Company should forecast harvest levels during the second five-year term to fall below the 90% harvest level stated in the current plan, the Company should request, with reasonable explanation, an undercut variation from the Minister and amend their management plan with a further surplus declaration.

RECOMMENDATION: That the Company improve their yield records so that harvest allocations may be more accurately planned.

TABLE 3

Comparison in Hectares, by Working Group, of the 1985-1990 Maximum Allowable Depletion (MAD), Declared Surplus, Forecast Harvest, Actual Harvest, and Percentage Difference between the Forecast Harvest and Actual Harvest.

FMA 50260C
Nakina Forest
Kimberly - Clark Canada Inc.

Working Group	1985-1990 MAD	Declared Surplus	Forecast Harvest	Actual Harvest	% Actual vs. Forecast
Spruce x, 1, 2	33,850	20,014	10,930	4,736	43
Spruce 3	13,220	10,563	1,382	457	33
Jack Pine	7,955	4,658	2,836	1,466	52
Balsam Fir	4,537	3,973	407	211	52
Poplar	12,004	3,209	5,474	2,114	39
Birch	2,429	2,263	151	143	95
Total	73,995	44,680	21,180	9,127	43

Data Source: 5 yr Summary

2.4 NSR OBLIGATIONS

Under provisions of the Agreement, the Company has an obligation to reforest NSR lands at the rate of 5% of classes NSR 2 and 3 lands annually. The Company had a regeneration agreement with the Ministry prior to signing an FMA and as a result of this renewal program and the Ministry's renewal efforts, there are no NSR 2 or 3 lands requiring treatment.

However, while being under no obligation, the Company wishes to be able to return the present 9,363 ha of untreatable NSR 5 land back into a productive forest working group. The Ministry is currently conducting a re-survey of all NSR lands cut-over prior to 1985 and supplying the data to the Company for the purpose of reclassifying regenerated areas in their ongoing re-inventory.

2.5 ROAD CONSTRUCTION AND MAINTENANCE

Paragraph 31 of the Agreement provides for the Minister to reimburse the Company, subject to a maximum amount per kilometre, for the construction, reconstruction, and maintenance of roads on the Agreement area. To be eligible for payment, roads must be included in approved annual plans and constructed according to the standards specified in Schedule "E" of the Agreement.

FIGURE 2: COMPARISON OF ALLOWABLE DEPLETION AND HARVEST

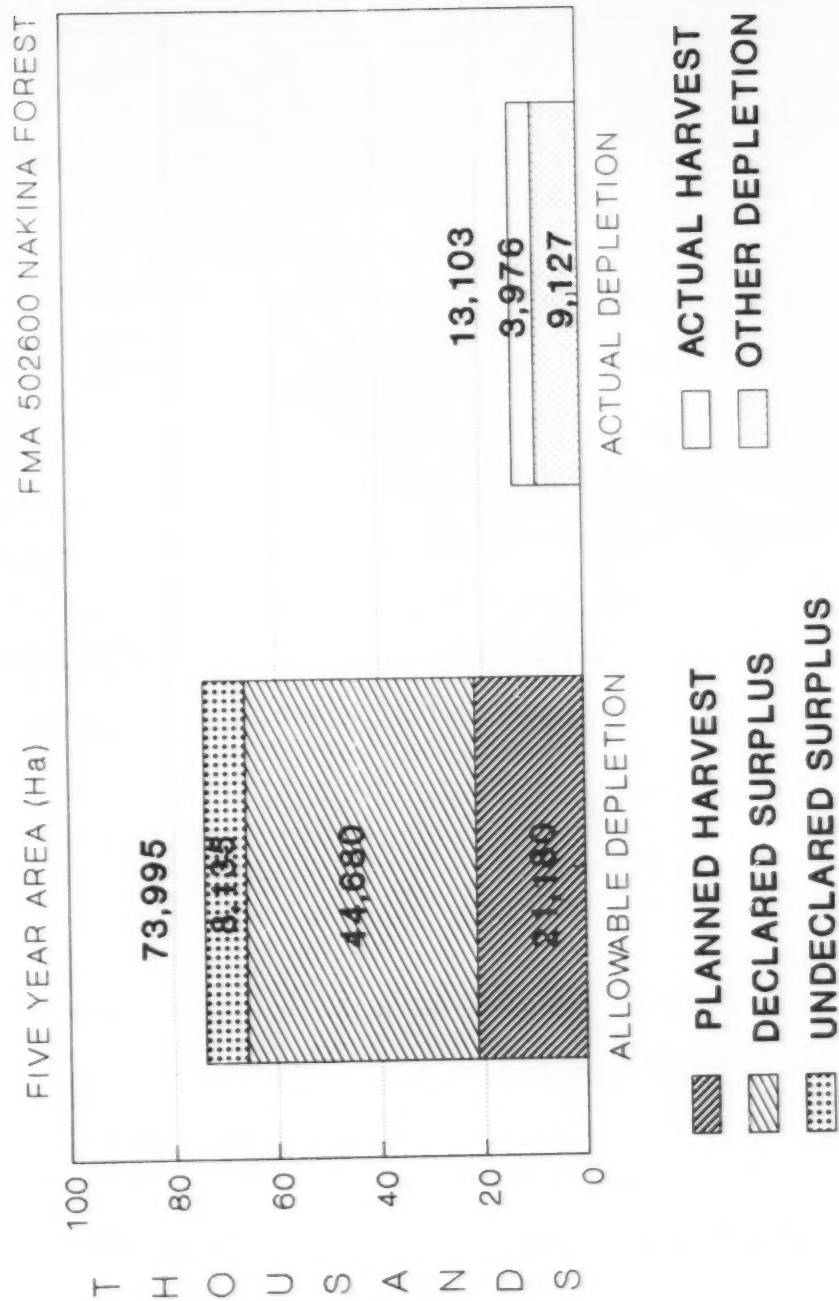


TABLE 4

Comparison of Forecast and Actual
Volumes in Cubic Metres (m³) of
Conifer and Poplar

FMA 502600
Nakina Forest
Kimberly - Clark Canada Inc.

Species	Forecast m ³	Actual m ³	% Actual vs. Forecast
Conifer	1,922,602	1,291,535	63
Poplar	971,120	637,658	66
Total	2,893,722	1,857,193	64

Data Source: Table 4.3.1 (1990-1995 TMP)

TABLE 5

Comparison of Actual and Forecast Yields
of Conifer and Poplar in Cubic Metres
per Hectare (m³/ha).

FMA 502600
Nakina Forest
Kimberly - Clark Canada Inc.

Species	1980-1985 Actual	1985-1990 Forecast	1985-1990 Actual	1985-1990 % Actual vs Forecast	1990-1995 Forecast
Conifer	113.5	84.0	113.7	159%	125.9
Poplar	20.5	36.9	69.9	189%	28.9

Data Source: 5 yr Summary Yield Data

Prior to signing of the FMA, little of the Nakina Forest was accessible by road; only 25% of the forest was serviced by roads in 1985. Table 1 shows that between 1985 and 1990, a total of 102.9 km of primary and secondary roads was constructed or reconstructed (5% reconstructed). This was only slightly more than was built in the previous five years (90.4 km). Compared with other FMAs, this was a modest road-building program. For example, the Company built almost twice as many new roads in their Longlac FMA area to the south. This is understandable for the Nakina Forest is much farther from the Company's mill in Terrace Bay and hauling costs are higher. FMA roads provided access to the central and eastern portions of the forest and reflected mainly the northern extension of four primary roads, the Maun, Storm, Supawn, and Waba. The network has allowed planned cuts to be dispersed over the landscape for the next operating period. Despite this, concentrations of inaccessible old timber remain, especially in the north and west.

All of the FMA funded roads were built by the Company. Weldwood of Canada, operating as a third party in this forest, were able to use existing roads to extract the poplar they required for their waferboard and plywood plants during the period under review. Most of the new roads were primary (73%) and thus received relatively high levels of FMA road funding. Despite this, and the fact that road building is relatively easy because of upland road chances and numerous local gravel deposits, FMA funding covered only part of the actual cost of these roads. The Company has traditionally built roads in this area to very high standards for year-round delivery of wood to the mill. These high quality roads are open to travel by other users of the forest. Roads eligible for funding under the FMA were inspected jointly by representatives from the Company and the Ministry to verify standards and measure lengths. Once approved, the Ministry was invoiced by the Company. Table 1 indicates that cumulatively 220 km of road received Ministry funding for maintenance. The Company maintains an additional 284 km at their own expense. Roads eligible for FMA maintenance dollars were graded, snow ploughed, and regravelled or repaired where necessary. Field inspections by the review team revealed that the roads were well-maintained.

2.6 COMPANY RECORDS

The Company records for access roads, forest depletion and silvicultural projects were examined by the review team.

Annual depletion record preparation begins each spring with the cut-over maps, where flight lines are plotted and supplementary aerial photographs are taken for each cut block. Cut-overs and depletions are marked on the photos, transferred to FRI forest type maps, and checked against AWSs and with camp foremen to classify depleted areas (reserves, unmerchantable, inoperable areas) that have been identified. Permanent depletion maps, colour-coded for the different categories, are prepared and areas are determined and entered into a computer program. This program will then prepare all tables, summaries, and stand listings to update the forest inventory and provide management information for the new plan cycle.

Silvicultural project data is recorded manually by Company technicians on silviculture cards and type maps (scale 1:15,840). This data is superimposed over the harvest area and colour-coded on the permanent compartment maps. All Company and Ministry silviculture records since 1985 have been entered into the Company's computerized silvicultural information system using Powerbase. This program is quite adequate for Company needs, will produce all the necessary reports and summaries, and can be used to produce project invoices. The program is not compatible with the Ministry's silvicultural information system (SIS).

Road construction and silvicultural projects are approved for payment following the procedure specified in Paragraph 10 of the ground rules. The accuracy of silvicultural reporting was checked by using a dot grid to determine the area of three relatively small site preparation projects. Two checked out 5% below the approved area and one was 2% below. The Ministry had approved the Company figure in each case.

Survival and stocking of plantations is determined through a series of assessment plots established in the first year and tallied in the first, third, and fifth years. Aerial seeding and natural regeneration is

assessed in the third and fifth year. All stocking and survival data were calculated manually during the review period (1985-1990) but will be included in a new Powerbase computer program in 1990.

The review committee was satisfied that Company records were well kept and meet the requirements of the Agreement and the preparation of plans. The variety of data used and the massive amounts of information, maps and reports required in the TMP planning process have made this a very important subject to FMA holders. An updated system amalgamating the data and mapping requirements into a Geographic Information System would greatly improve FMA data management and plan preparation.

2.7 ANNUAL REPORTS

Paragraph 38 of the Agreement requires that the holder prepare an annual report in accordance with the approved manual, summarizing certain aspects of operations during the preceding year.

The annual report of Company operations on the Nakina Forest is submitted in two parts: a combined silviculture and road report in April and a separate depletion report in November, as specified in the Agreement and the TMP manual. The planning manuals require only tabular summaries of operations. Thus, no dated, written report was made outlining highlights, problems, amendments, and other significant happenings in the year. It would greatly simplify the preparation of other plans (e.g., the section entitled Report of Past Forest Operations in the next TMP) and the review process if such information was given annually. Records of submission dates were incomplete in the files of the Ministry and also those of the Company, but a review of both sets of records revealed that reports were on time or could not have been more than a few days late.

RECOMMENDATION: That annual reports be dated and contain a descriptive page of the year's highlights, including explanations for major differences between planned and actual achievements, amendments, and other significant events.

In most categories and for most years, the accuracy of annual reports of Company operations on the Nakina Forest was acceptable. For example, all road construction outlined in the annual reports was supported by invoices for the same distances and payments. However, there were some problems. For example, the 1988-1989 annual report was submitted by April 10, 1989 and forwarded immediately to the regional director and to the director of the Timber Sales Branch, as specified in the instructions accompanying each reporting form in the TMP manual. Because the Company and the Ministry did not check the report thoroughly before it was forwarded, major clerical errors in the renewal section were not discovered by the Ministry until eight months after the report was first submitted. The Company and the Ministry revised this table for their own records, but this was too late to prevent the incorrect data from reaching head office. A few other minor errors in reports of Company and Ministry work were not discovered until preparation of the five-year summaries when the Company was computerizing their records. The committee suggests that the Ministry formally inform the Company when each annual report has been approved to ensure that both parties are aware of the status of annual reports.

RECOMMENDATION: That the Company and the District Crown Representative (DCR) of the Ministry thoroughly check and reconcile figures used in annual reports covering operations in the Nakina Forest before the reports are formally submitted to the Ministry, and that the

DCR Inform the Company in writing when each annual report has been approved by the District.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 14 of the ground rules, entitled Modified Management Areas (now called Areas of Concern or AOCs) explains how the Ministry, in consultation with the Company, will manage certain lands to meet objectives other than or in addition to the production of wood fibre. The Agreement recognizes two types of AOCs: linear AOCs along roads and waterways, and non-linear AOCs encompassing mainly wildlife habitat.

As specified in the ground rules, AOCs in or near areas scheduled to be cut during 1985-1990 were identified on maps and accompanying summary sheets in an appendix to the operating plan. More detail on prescriptions (including seasonal cutting restrictions) for specific AOCs in areas important for tourism was given in the twenty-year management plan. Details of all AOCs were included by the Ministry in the Company's Cutting Approvals. A total of 283 AOCs was identified in the new 1990-1995 TMP. These AOCs encompassed bald eagle and osprey nests, canoe routes, special features of moose habitat, remote cottages and tourism lakes, access points, and areas planned to be treated silviculturally with prescribed burns.

During the period under review (1985-1990), all AOCs were reserves where no cutting occurred. The reserves ranged from 60 to 120 m in width (most were 120 m) and were designed to protect attributes of fisheries and moose habitats, as well as for aesthetic purposes. Only one nest (osprey) required protection at that time. Ministry staff revealed that the Company themselves reported information useful for fisheries or wildlife management on the Nakina Forest (e.g., the location of nests and cold water streams). There were cases where roads were rendered inaccessible by gates or ditches so as not to compromise the remoteness of tourist outposts or lodges. In areas where the interests of individual tourist operators did not take precedence, the general public was able to use, for recreation, the high quality roads built by the Company primarily for purposes of timber extraction. Some tourism concerns are much more significant on the Nakina Forest than in the Longlac Forest, the Company's other FMA area immediately to the south. There are forty two outpost camps, seven fly in lodges, many remote cottages, and commercial fishing operations on three of the larger lakes in the Nakina Forest.

Roads generally followed the existing north-east to south-west drainage, minimizing the number of major crossings needed. In 1985-1990, specifications for water crossings were left up to the Company. Field inspections showed that wash-outs resulted on some tertiary roads because culverts were too small to handle periodic heavy water flow, or because debris from beaver dams had not been cleared from the culverts. The Company and the DCR assured the committee that crossing problems will be minimized during the next operating period with application of the guidelines and good practices outlined in the Environmental Guidelines for Access Roads and Water Crossings. The Company is endeavouring to ensure that future crossings are environmentally acceptable as evidenced by their initiation of a two-day seminar for Company field staff on application of the new crossing guidelines.

Field inspections showed that clearcut size reflected the standards of 1985-1990. Although it was not the intent of the Company at the time, the effective size of most cuts was reduced by natural topographic variation, and patches of unmerchantable or inoperable timber. Also, cut size was greatly reduced where strip cuts were used to enhance natural regeneration of lowland black spruce. However, some of the old cuts were larger than would be acceptable under the present moose guidelines. On the Nakina Forest, some requirements of these guidelines were applied beginning with the 1988-1989 AWS.

The Company has a very good relationship with other forest users. For example, although not required to do so, they personally contacted individuals who might have concerns regarding specific timber operations proposed for the Nakina Forest. The Company is commended for their initiative and co-operation with the Ministry in this respect.

3. MAINTENANCE OF PRODUCTIVITY

Table 2 shows the maximum allowable depletion (MAD), which was calculated at the beginning of the five-year term (1985-1990) for the Nakina Forest, to be 73,995 ha for all working groups combined. The calculations were based on the OWOSFOP method of determining MAD, which gives an accelerated harvest early in the planning period and a reduced volume later in the rotation.

The Ministry and Company were especially concerned with the long-term over-harvesting and current accelerated allocation of upland spruce. This has caused a harvesting imbalance between spruce upland and lowland sites, threatening the year round delivery of wood and the consistent flow of by-product material. To stabilize the economic wood supply to the mills through sustained yield management, the Ministry requested that the Company use the FORMAN model to calculate the 1990-1995 MAD. This model utilizes growth and yield data, in addition to factors used in the OWOSFOP model, to develop a sustained yield wood supply plan. The original spruce working group has now been divided into three forest units for the 1990-1995 MAD and in the development of the new inventory being prepared for the 1995-2015 TMP.

The three forest units are as follows:

1) spruce upland	FRI - SX,1,2	Rotation age 90 years
2) spruce lowland	FRI - SX,1,2	Rotation age 100 years
3) spruce lowland	FRI - S3	Rotation age 110 years

Implementation of the FORMAN model and reclassification of the spruce working group into three forest units has resulted in a 1990-1995 MAD of 25,863 ha versus a 1985-1990 MAD of 73,995 ha; the allocation of the spruce working group was reduced by 61%. On the basis of the facts presented the Committee agrees with the use of the FORMAN model but feels that such a dramatic change in the harvest cut calculation over such a short period of time, not only alters the flow of fibre but questions the credibility of all forest regulation calculations in a period of close public scrutiny.

The committee commends the Company and the Ministry for their initiative in developing this classification of the spruce working group and recommends its consideration in other FMAs with a similar imbalance of harvesting on upland and lowland spruce sites.

From 1950 to 1988 the Company operated a forest nursery. Planting stock from the nursery was used in an annual renewal program of their harvest area. To further long-term productivity, seed orchards were established in 1951 for black spruce and white spruce, and seed from these orchards was used to grow most of the planting stock. The Company planted in excess of 35 million trees prior to the signing of the FMA and the Ministry and Company planted the 100 millionth tree on the limits in 1989. The committee commends both parties for this achievement. In 1988 the Company closed the forest nursery as a result of excess growing capacity at the MNRs nursery in Thunder Bay and the inability of the Ministry and the Company to agree on a mutually acceptable price paid for the planting stock. The Ministry is currently tending the seed orchard.

The committee believes the Company to be fully committed to the FMA but notes that 1990 is the first year the Company has assumed responsibility for the full work load following the phase-in period. This increase of field work in addition to inventory, management, and planning responsibilities has placed a heavy work load on the forestry staff which has remained constant since the early 1980s. The problem associated with improving the growth of poplar on many mixed wood sites being allowed to regenerate naturally to poplar will continue to add to the forestry workload. The Company may wish to review their professional staff workload to ensure the successful management of the Nakina Forest.

The committee is concerned that the Ministry planting cap and funding constraints are resulting in the conversion of mixed wood stands to poplar by natural regeneration. On the Nakina Forest, many of these sites produce poor quality aspen.

4. COMPANY CONCERNS

The Company was provided an opportunity to express any concerns regarding FMA 502600, the Nakina Forest, or the Ministry's administration of the Agreement. The following are the concerns as expressed by Kimberly-Clark Canada Inc.:

- i) the liquidated damages clause in the FMA -This clause was intended to prevent companies from avoiding surplus declarations. In the case of the Kimberly-Clark licence, the surplus as identified in the first five-year period has been proven not to exist. The Company believes there are too many unpredictable, unavoidable variables to enable a prediction within 10% accuracy of the allocation of large areas and volumes of timber over a five-year period.
- ii) the reduction of the level of FMA funding for roads.
- iii) the interpretation of various Ministry guidelines by Ministry staff as being rules and not guidelines.
- iv) the cap on nursery stock production.
- v) the administrative requirements of planning and managing two FMAs.
- vi) the provincial planting rates do not adequately reflect the cost of planting bareroot and container stock.

vii) the need for refrigerated tree storage in the Geraldton District.

5. CONCLUSIONS AND RECOMMENDATIONS

The review committee was satisfied that the obligations of the Company under the Agreement have been satisfactorily performed during the five-year term under review. They were particularly impressed by the co-operation between the Company and Ministry staff, as demonstrated by their solution to management problems in the spruce working group through establishment of three forest units to better reflect management requirements. The Company has also clearly demonstrated their ability to modify harvesting methods and silvicultural prescriptions to successfully regenerate lowland spruce sites. The committee is concerned however with the quality of natural regeneration in the poplar and birch working groups. The Company may wish to review its professional staff workload and availability of equipment necessary to undertake the development work associated with successful natural regeneration of hardwoods.

The committee was concerned by the dramatic change in the MAD calculation between the 1985-1990 and 1990-1995 plan periods, and the effect this could have on public perception of forestry calculations. The committee commends the Company for a very successful artificial regeneration program and a demonstrated ability to address the needs of other user groups on the Nakina Forest.

The following are the committee's recommendations:

RECOMMENDATION NO. 1: That the Minister extend the remaining period of FMA 502600 for a further term of five consecutive years to March 31, 2010.

RECOMMENDATION NO. 2: That the Company provide the opportunity for key staff to upgrade poplar management skills using the Forest Ecosystem Classification, poplar silvicultural publications, and training arranged through the Technology Development Unit in Thunder Bay.

RECOMMENDATION NO. 3: That 1) the Company review the status of lands cut-over during the five-year term for which Table 1 of the ground rules specifies treatment, but which have received no treatment, and 2) the Company propose areas to be classified as non-treatable to the Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to the preparation of the 1995-2015 TMP.

RECOMMENDATION NO. 4: That in the event the Company should forecast harvest levels during the second five-year term to fall below the 90% harvest level stated in the current plan, the Company should request, with reasonable explanation, an undercut variation from the Minister and amend its management plan with a further surplus declaration.

RECOMMENDATION NO. 5: That the Company improve their yield records so that harvest allocations may be more accurately planned.

RECOMMENDATION NO. 6: That annual reports be dated and contain a descriptive page of the year's highlights, including explanations for major differences between planned and actual achievements, amendments, and other significant events.

RECOMMENDATION NO. 7: That the Company and the District Crown Representative (DCR) of the Ministry thoroughly check and reconcile figures used in annual reports covering operations in the Nakina Forest before the reports are formally submitted to the Ministry, and that the DCR inform the Company in writing when each annual report has been approved by the District.

FIVE YEAR REVIEW
KIMBERLY-CLARK CANADA INC.

LOONGLAC FOREST
FMA 502700

1985-1990

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1. INTRODUCTION

1.1 PURPOSE OF THE REVIEW

The Ministry of Natural Resources (the "Ministry") and Kimberly-Clark Canada Inc. (the "Company") signed a Forest Management Agreement or FMA (the "Agreement") for the Longlac Forest, located north east of Thunder Bay, on June 13, 1985. The purpose of this Agreement was to provide for a continuous supply of forest products to the Company's wood processing plants at Longlac and Terrace Bay, Ontario, and to ensure that the forests of the Longlac Forest are harvested and regenerated to produce successive crops of timber on a sustained yield basis.

This review of the first five consecutive years of the Agreement was conducted on the Longlac Forest to determine whether the obligations of the Company under the Agreement have been satisfactorily performed and to recommend to the Minister of Natural Resources whether the remaining period of the Agreement should be extended for a further term of five years.

1.2 THE REVIEW COMMITTEE

The review was carried out by a committee of three (the "Committee") engaged by the Ministry of Natural Resources for this purpose. The members were as follows:

- Mr. C.J. Heeney, B.Sc.F., Dip. R.M.,
Supervisor, Forest Production and Control (Retired),
Ministry of Natural Resources,
Committee Chairman
- Mr. G.W. Bell, B.Sc.F., R.P.F.,
Vice-President Woodlands (Retired),
Spruce Falls Power and Paper Company Ltd.
- Ms. K.J. Szuba, B.Sc.F., Ph.D.,
Consulting Biologist

1.3 TASKS OF THE REVIEW COMMITTEE

The review committee's assignment was to undertake a fair and objective review of Kimberly-Clark Canada Inc.'s performance on the Longlac Forest during the first five year term vis-a-vis their obligations under Forest Management Agreement 502700 and to make recommendations to the Minister of Natural Resources on the extension of the Agreement's term according to the "Evergreen" section of the Agreement (i.e., Section 15, paragraph 33).

The review was conducted by:

- examining the management, operating and annual plans, and the annual reports prepared by the Company with regard to their submission dates and their acceptability to the Ministry,
- inspecting the depletion, silvicultural and access road records for adequacy and for conformity with the management plans and the ground rules of the Agreement,
- comparing the levels of harvest and treatment of Not Satisfactorily Regenerated (NSR) lands outlined in the annual reports with the levels required by provision of the Agreement,
- selecting and field inspecting harvest cuts, silvicultural projects, and road construction typical of the techniques employed on the forest for conformity with the Agreement holder's records and for field application of the ground rules,
- determining the degree to which other forest users and other forest values are accommodated in timber management planning and field operations, and
- meeting with Company and Ministry district staff to identify problem areas and Agreement concerns on the part of either party.

2. PROCEDURES AND FINDINGS

2.1 MANAGEMENT PLANNING

2.1.1 THE PREPARATION AND SUBMISSION OF PLANS

Paragraphs 6(1), 10(1), 11(1), and 15(1) of the Agreement require the Company to prepare management and operating plans and a series of annual plans. These plans must be prepared and submitted according to the time frame specified in the Agreement and according to the manual that has been approved by the Minister for this purpose.

The Forest Management Agreement for the Longlac Forest was signed on June 13, 1985. Initially the Company and the Ministry agreed that the management and operating plans would be submitted by October 1, 1985. The October 1st submission date was unattainable and the Company requested a series of extensions to June 13, 1986. Subsequently, a final extension to August 31, 1986 was negotiated and the Company submitted the management plan by this date. This plan was not accepted by the Ministry. The specific concern was the over allocation of upland spruce in the Longlac Forest. For the plan period it was agreed, following discussion with the Ministry, to split the spruce working group site classes X, 1, and 2 into upland and lowland forest units. It was also agreed to further divide the existing inventory of the spruce group into three units with separate rotation ages for preparation of the Timber Management Plan (TMP) due April 1, 1990. The plan was approved by the Ministry on March 11, 1988.

The operating plan for the five-year period (1985-1990) was due on December 13, 1985. An extension to February 13, 1986 was granted by the Ministry and the plan was completed and

submitted on February 25, 1986. After review by the Ministry, the plan was returned to the Company for amendment. The plan was resubmitted on August 15, 1986, approved on March 13, 1987, and underwent public inspection during April 1987.

The first annual plan (1985-1986), now called Annual Work Schedule or AWS was not submitted until January 24, 1985 nor was it approved by the Ministry until April 22, 1985. Subsequent AWSs were generally submitted and approved on time.

The TMP for the Longlac Forest for the second five-year term (1990-1995) has been prepared in accordance with the Timber Management Planning Manual for Crown Lands in Ontario (1986). The document was prepared on time and was approved on February 22, 1990.

In conclusion, for the period under review, the Company has prepared the required plans on time and has shown an ability to successfully resolve planning issues with the Ministry and other users.

2.1.2 PLAN IMPLEMENTATION

The Company required, under the Forest Management Agreement, to conduct all forestry operations in accordance with approved management, operating and annual plans. These plans include Company operations for 78% of the planned harvest volume and third party commitments to Lecours Lumber (12%) and Weldwood of Canada (10%). The accomplishments of the Company in silvicultural operations and road construction are shown in Table 1.

The review committee examined Company planning documents and performance records, supplemented by ground inspections for harvest cut, road construction and silvicultural operations.

For these activities, harvesting was 70%, road construction was 90%, and silvicultural activities 60-101% of the planned levels as shown in Figure 1. This reduced activity on the Longlac Forest was largely due to the closing of the Company's sawmill in Longlac in 1987.

The 1985-1990 operating plan outlines a forest renewal program of 19,513 ha and a planned harvest area of 43,221 ha indicating that 45% of the harvest area was planned for renewal. The actual forest renewal of 17,503 ha was 58% of the 30,408 ha of actual harvest. This was a significant improvement over the plan but still below the regeneration needed to sustain a productive forest.

The committee was advised that in the new TMP, planned forest renewal is 31,840 ha or 83% of the 38,586 ha planned for harvest. This is a significant improvement over the level achieved in the past five years and includes 14,340 ha of natural regeneration, mainly spruce lowlands and hardwoods.

More detail on the silvicultural accomplishments of the Company will be found in Section 2.2.2. final road locations. These final locations corresponded exactly to those illustrated on 1:15,840 scale maps which accompanied the invoices. Segments of three roads were about 400 m from their planned locations. The committee noted that deviations of this magnitude are acceptable under the rules of the new TMP manual. A segment of the Concord road was more than 500 m from its planned location but no amendment to the operating plan was requested by the Ministry as the road was not in a sensitive area. These deviations arose because of unexpected construction problems presented

Table 1

Summary of Company Forest Operations with Ministry Funding

FMA Expenditure and
Accomplishment Report
for the Five-Year Term
1985-1990

FMA 502700
Longlac Forest
Kimberly Clark Canada Inc.

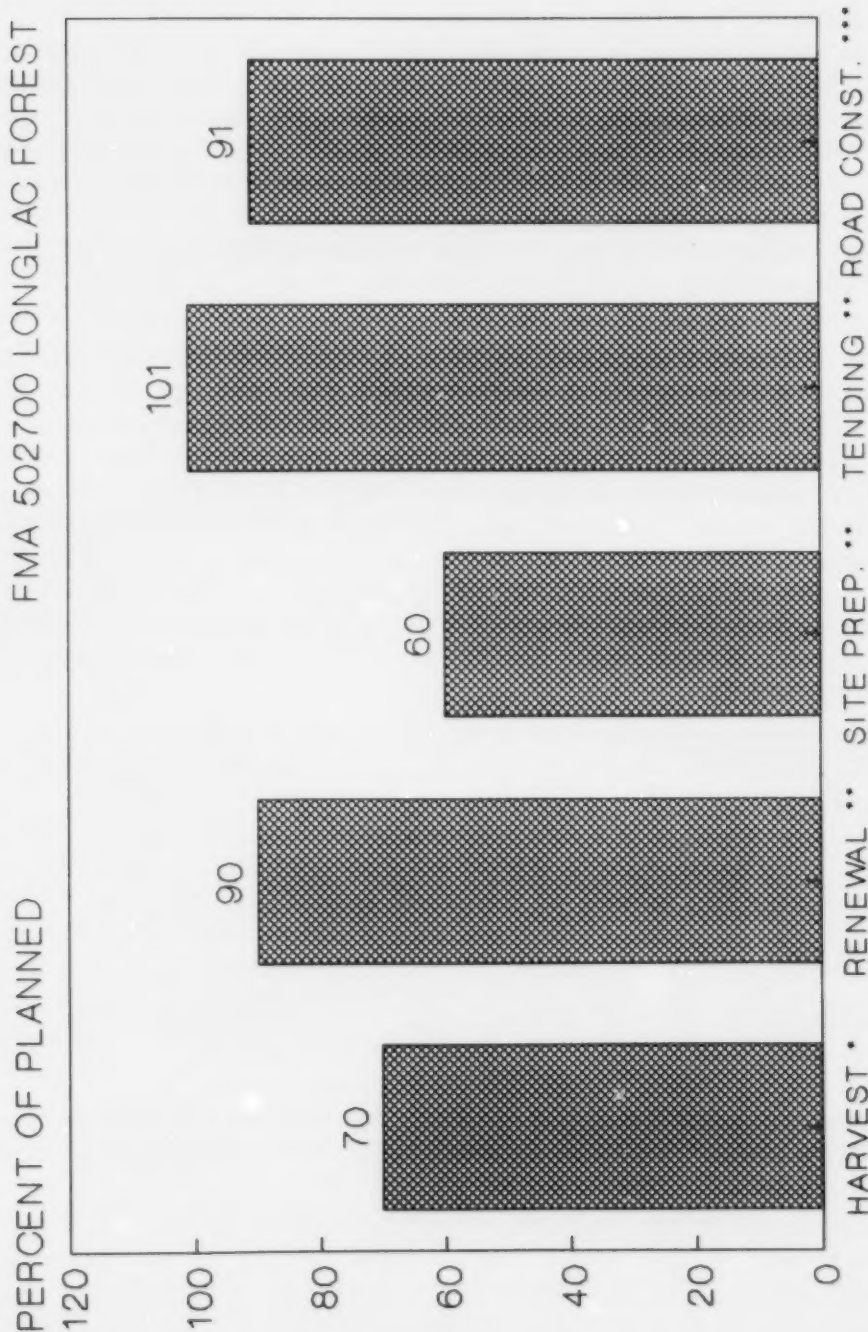
ACTIVITY	AREA (hectares)	COST (dollars)
Harvest	30,408	
Natural Regeneration	6,454	
Artificial Regeneration		
- Planting Bareroot	3,059	
- Planting Container	941	
- Seeding - Direct	1,017	
Total Regeneration	11,471	\$ 1,621,589
Retreatment	0	
Site Preparation		
- Mechanical	6,797	
- Chemical	1,027	
Total Site Preparation	7,824	\$ 2,022,826
Tending		
- Aerial	9,580	
- Ground	9	
- Manual	31	
Total Tending	9,620	\$ 420,374
Other Costs (Chemicals, Stock Delivery)		\$ 743,617
Total Silvicultural Payments		\$ 4,808,406
	(kilometres)	
Road Construction		
- Primary	143.9	
- Secondary	54.8	
Total Road Construction	198.7	\$ 6,948,320
Road Maintenance	418.1	\$ 205,251
TOTAL ROAD PAYMENTS		\$ 7,153,571
TOTAL PAYMENTS		\$11,961,977

NOTE: Forest management activities were also conducted by MNR at additional expense as part of the MNR obligation under the agreement.

Data Sources:	Harvest Cut	- Table 4.1 (4 yrs actual, 1 yr est.)
	Nat. Regen.	- Table 6.4.2, (5 yr. summary)
	Renewal	- Table 4.4.1.4 (5 yr summary)
	Renewal \$	- Table 6.4.3 (5 yr summary)
	Roads	- 5 yr summary attachment # 5

FIGURE 1: COMPARISON OF OPERATING PLAN VS ACTUAL

FMA 502700 LONGLAC FOREST



Data Source:

• Harvest: Table 4.1 (4 yrs actual and 1 yr estimate)

•• Table 4.4.3.4 and 6.4.2

••• Table 6.6 and 4.4

by rough, boulder-strewn terrain. The Company's current practice of flying by helicopter over proposed road rights-of-way will help to more definitely establish final road locations during plan preparation.

The harvest cut records of the Company generally conform to the area allocated for harvest as specified in the planning documents. However, planned and actual locations of funded primary and secondary roads differed in a few cases. The committee checked this by superimposing maps (scale 1:63,360) from the 1985-1990 operating plan (planned locations) onto mylar maps which showed the Road construction averaged 91% of the planned amount for 1985-1990 (see Figure 1). Achievement for primary roads (93% of planned) was greater than for secondary roads (86% of planned). The shortfall in road construction reflected changes in the area of harvesting operations, FMA funding constraints, and the inability of the Company to extend one road beyond an existing bridge once its load-bearing potential was declared inadequate by Ministry engineers.

There were five minor amendments and five administrative amendments to the operating plan. Two administrative amendments covered stands which were marked for harvest on the operating plan maps but were accidentally omitted from the stand listings. Three minor and one administrative amendments concerned roads. One of these permitted the advance cutting of 10 km of road right-of-way to a contingency area which was allocated for harvest, pending successful tests of the merchantability of white birch in the Company's pulping process, and the others involved changes in road locations due to constraints of terrain. Another administrative amendment permitted harvesting of stands previously thought to be unmerchantable. Finally, the Ministry initiated two minor amendments to create reserves to facilitate protection of moose and fisheries habitats in a total of eighty seven new Areas of Concern (AOCs; note that AOCs were formerly called Modified Management Areas or MMAs).

2.2 THE GROUND RULES

2.2.1 KNOWLEDGE AND FAMILIARITY WITH THE GROUND RULES AND THE AGREEMENT

Based on discussions with the Company both in the Longlac Forestry office and in the field, it was apparent to the review committee that Company staff were familiar with the provisions of the ground rules and the Agreement.

2.2.2 CONFORMITY OF HARVEST AND SILVICULTURAL OPERATIONS WITH THE GROUND RULES

Through examination of depletion and silviculture records, field inspections, and discussions with both Company and Ministry staff, the review committee has confirmed that harvesting and silvicultural operations were conducted in accordance with the ground rules.

Company harvesting operations were conducted by four commuter operations, one mechanical, and three conventional cut and skid operations. This has changed to two mechanical and two cut and skid operations commuting from Longlac and Terrace Bay. Two third party operations were conducted by Weldwood and Lecours Lumber. In both cases, the third party operator is held responsible for depletion records, roads, and forest renewal on their assigned areas by the FMA holder.

On upland sites the principal silvicultural activity is tree planting of black spruce, jack pine, and white spruce bareroot and container stock. During the field trip, nine planting projects of varying age were visited and the committee was favourably impressed by the site quality and plantation success. Three spruce plantations recently established on prescribed burn areas in the north-east corner of the forest were growing beautifully and are a credit to both the Company and the Ministry.

Site preparation for the period under review (1985-1990) on the Longlac Forest was done mechanically on 64% of the site prepared area. Chemical site preparation was used on 20% of the area, and prescribed burns on 16%. On some of the productive sites found in this forest, chemical site preparation has been used in combination with mechanical and prescribed burns but the resulting plantations still have a competition problem. Mechanical site preparation consisted of the use of barrels and chains, TTS disc-trencher, and the Donaren powered disc-trencher on upland sites and mechanical full-tree harvesting and/or shear blading on lowland spruce sites. The herbicide "Vision" was used for site preparation on several sites with variable results. The three prescribed burns visited provided excellent site preparation for planting.

Site preparation on the Longlac Forest encounters a range of very difficult sites ranging from deep, rich, silt and clay loams found in the north-east to the rough, shallow and bolder-strewn sites found in the south. In both cases, heavy duff and debris common to overmature stands are found. The Company have recognized their site preparation problems and have used a Waddell scarifier from Sweden on various sites to evaluate its effectiveness under these conditions. Other equipment including a C&H plough or similar heavy duty V-blade for corridor preparation in heavy debris should be investigated to help develop successful prescriptions and reduce the backlog of NSR lands developing on these sites.

There was a modest program of aerial seeding in the forest in the period under review. Four sites were visited and all appeared satisfactorily stocked to jack pine with some patches of poplar. Tending is required on these sites to maintain the jack pine working group. The 1985-1990 ground rules for aerial seeding permit jack pine regeneration on suitable sites in all working groups except poplar. The present prescription calls for site preparation, seeding (two applications of 50,000 viable seeds per hectare) and tending as required. On some sites visited, the committee felt that mineral soil exposure (MSE) was insufficient to ensure seeding success and that if the MSE could be increased, a single seeding would give good results one year earlier. The Donaren powered disc-trencher should be capable of providing good site preparation for aerial seeding on the sites encountered. Better use of the power head feature will be required and a forwarder type prime mover for stability should be considered.

Stand tending is essential in the successful establishment of conifer plantations, particularly on the productive sites found on the Longlac Forest. Competition from aspen, raspberry, shrubs, and grasses was found to a varying degree on all planting and seeding sites visited. The Company is working hard to monitor its plantations and provide aerial tending when needed, but it is falling behind on these highly competitive sites. Seven of the conifer regeneration sites visited are in need of tending; some are scheduled for treatment in 1990.

In the period under review, the area of aerial herbicide application (tending and site preparation) was 115% of the total area planted and seeded. The TMP (1990-1995) calls for aerial herbicide application on an area equal to 82% of the area to be planted and seeded. Considering that tending

is also required on some of the natural spruce regeneration (6,070 ha) and as a second application on many of the planted areas, tending should be increased to ensure that desired trees become Free-to-Grow (FTG).

RECOMMENDATION: That the Company review their tending program for all sites regenerated to coniferous working groups to ensure that plantations reach Free-to-Grow status.

In the period under review the Company had to depend on natural regeneration in the Longlac Forest to regenerate 64% of their annual harvest area, mainly in the poplar, birch, and lowland spruce forest units. However, at the time of the review, only 6,454 hectares of the 19,359 hectares left for natural regeneration, has been declared renewed. Two examples of natural regeneration of black spruce lowlands were visited, one, a block cut, was well regenerated in seven years and the remaining leave blocks have been removed. The other, a clearcut with no standing seed source is a failure to date.

The mechanical harvesting of spruce lowlands using block cuts to provide silvicultural shelter and seed source, shows excellent promise on both Company FMAs (Longlac and Nakina) as a management prescription for lowland black spruce. These areas also provide good temporary cover for wildlife. The Company must ensure that application of the moose guidelines is agreed to at the time of planning so that travel corridors remain when leave blocks are harvested 5 - 10 years later. The committee was very favourably impressed by the successful management of black spruce lowlands on the Longlac and Nakina Forests.

Four areas visited by the review team have been designated for natural poplar regeneration. The regeneration was found to be of poor quality and stocking, but will probably meet minimum standards.

With FMA planting stock and funding constraints, the Company is to be congratulated for prescribing natural black spruce and aspen regeneration on suitable sites. The use of the new Forest Ecosystem Classification (FEC) for northwestern Ontario will assist Company foresters to better classify forest sites and develop prescriptions for specific sites to ensure quality and stocking of natural regeneration for the working group species.

RECOMMENDATION: That the Company provide the opportunity for key staff to improve their knowledge of forest sites using the Forest Ecosystem Classification and training arranged through the Technology Development Unit in Thunder Bay.

The ground rules permit the classification of non-treatable sites by mutual agreement. While the Company is commended for their forest renewal program, they have not declared any area non-treatable in the first five-year period of the Agreement. This has permitted time for the Company to observe what happens to these types of sites. Although non-treatable areas are presently a small proportion of the cut-over area on the Longlac Forest, the committee believes that recognition and reporting of non-treatable sites will contribute to a more accurate forest inventory.

RECOMMENDATION: That 1) the Company review the status of lands cut-over during the five-year term for which Table 1 of the ground rules specifies treatment but which have received no treatment, and 2) the Company propose areas to be classified non-treatable to the

Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to the preparation of the 1995-2015 TMP.

2.2.3 CONFORMITY OF INVOICING AND OTHER AREAS

The invoicing procedures of the Company were found to be in general conformity with those specified in paragraph 10 of the ground rules.

2.2.4 PREPARATION OF NEW GROUND RULES

The Forest Management Agreement with the Company requires both parties to commence the preparation of new ground rules for the next five-year term at least eight months prior to the expiry of the old ground rules, and to agree upon those new ground rules on or before the expiry date of March 31, 1990. At the time of this review, the new ground rules were prepared and agreed to by Company and Ministry staff.

2.3 HARVEST LEVELS, MAXIMUM ALLOWABLE DEPLETION, YIELDS AND WOOD FLOW

According to paragraph 20(1) of the Agreement, the Company has agreed to maintain their harvest on the Longlac Forest at a level between 90% and 110% of the calculated allowable depletion (allowable cut) for each working group. The Company may request the Minister to authorize variations to the levels specified in the Agreement.

Paragraphs 20(3) and 20(4) of the Agreement provide for either a remedy or liquidated damages in the event of an overcut or undercut, respectively, on the area under agreement. The Agreement holder may avoid liquidated damages through the declaration of timber surplus to their needs in an approved management plan (paragraph 20(5)); however, liquidated damages do not apply in the first five-year term of a Forest Management Agreement.

Table 2 provides information in hectares by working group for the maximum allowable depletion (MAD) from 1985 to 1990, the total depletion, actual harvest, area regenerated and the MAD for 1990-1995. An area equal to approximately 58% of the area harvested was regenerated, of which more than one-third was natural regeneration, during the five-year term. The remaining 42% can be broken down into roads and landings, conifer or hardwood working groups containing 30% or more poplar or birch, lowland spruce sites, and difficult overmature, upland sites which are presently untreatable. The stands in the spruce working group containing 30% hardwood are left for natural regeneration. The remaining sites will require treatment to become productive.

Table 3 indicates that 70% of the forecast harvest area was cut and that the jack pine working group was the only forest unit where the Company achieved the 90% - 110% objective. Figure 2 shows a comparison of allowable and actual depletion for all working groups combined. There are three reasons why the forecast area allocation was not harvested: 1) the Company under-estimated planned yields for conifer and poplar mainly because by-pass areas were included in the depletions

TABLE 2

Comparison in Hectares, by Working Group, of the Maximum Allowable Depletion (MAD) for the period 1985-1990, the Total Depletion, Actual Harvest, Renewal, Percent Renewal, and the MAD for 1990-1995.

FMA 502700
Longlac Forest
Kimberly - Clark Canada Inc.

Working Group	1985-1990 MAD	Total Depletion	Actual Harvest	Renewal	Percent Renewal	1990-1995 MAD
Jack Pine	3,032	1,281	1,053	2,920	277	747
Spruce x, 1, 2	35,016	16,936	13,731	8,665	56	21,972
Spruce 3	14,110	3,716	1,851	--	--	5,624
Balsam Fir	13,874	3,698	3,151	39	1	4,069
Poplar	11,884	7,999	6,293	4,739	75	8,652
Birch	20,184	5,578	4,329	1,140	26	1,891
Total	98,100	39,208	30,408	17,503	58	42,955

Data Source:

MAD 1985-90	- Table 2.7 Operating Plan
Total Depletions and Actual Harvest	- Table 4.1, 5 yr summaries (4 yrs actual, 1 yr est.)
Renewal	- Tables 4.4.3.4, 6.4.2 (5 yr summaries)
1990-1995 MAD	- Table 4.14, 1990-1995 TMP

for historical yield calculations used in forecasting the 1985-1990 area allocation; 2) the shutdown of the Longlac sawmill in 1987 reduced the annual harvest by 96,000 cubic metres of conifer, and 3) the increased use of purchased wood, stimulated by lost production arising from labour disputes, replaced the wood planned for delivery from the Longlac Forest. Tables 3 and 4 show that 90% of the forecast volume was harvested from 70% of the forecast area. The 10% not utilized during the five-year term was the result of reduced wood requirements caused by the permanent shutdown of the Longlac sawmill.

Table 5 indicates that conifer and poplar yields were under-estimated by 23% and 25% respectively for the 1985-1990 period. However, forecast yields for 1990-1995 are similar to the actual yields experienced during the five-year term.

Wood flow during the five-year term from the Longlac Forest was 75% to the Kimberly-Clark mills, 13% to Lecours, and 12% to Weldwood. Weldwood conducts harvesting operations in both poplar and conifer stands producing poplar and spruce peeler logs for their plywood mill, and poplar for their waferboard mill. Kimberly-Clark has first right of refusal on all surplus conifer.

TABLE 3

Comparison in Hectares, by Working Group, of the 1985-1990 Maximum Allowable Depletion (MAD), Declared Surplus, Forecast Harvest, Actual Harvest, and Percentage Difference between the Forecast Harvest and Actual Harvest.

FMA 502700
Nakina Forest
Kimberly - Clark Canada Inc.

Working Group	1985-1990 MAD	Declared Surplus	Forecast Harvest	Actual Harvest	% Actual vs. Forecast
Jack Pine	3,032	1,410	1,153	1,053	91
Spruce x, 1, 2	35,016	2,945	21,185	13,731	65
Spruce 3	14,110	6,653	2,512	1,851	74
Balsam Fir	13,874	6,753	4,936	3,151	64
Poplar	11,884	796	7,775	6,293	81
Birch	20,184	11,529	5,660	4,329	76
Total	98,100	30,086	43,221	30,408	70

Data Source: 5 yr Summary

Currently Kimberly-Clark purchases the conifer pulpwood and surplus conifer sawlogs are sold to local sawmills. Lecours conducts third party operations, mainly in stands damaged by spruce budworm east and north of Longlac, and harvests 23,000 cords of conifer. Weldwood has first right of refusal to poplar east of the Pagwa River and Kimberly-Clark has similar rights west of the Pagwa River. The Weldwood mill is located in Longlac, while the Lecours mill is in Calstock near Hearst.

RECOMMENDATION: That in the event the Company should forecast harvest levels during the second five-year term to fall below the 90% harvest level stated in the current plan, the Company should request, with reasonable explanation, an undercut variation from the Minister and amend their management plan with a further surplus declaration.

2.4 NSR OBLIGATION

Under provisions of the agreement, the Company has an obligation to reforest NSR lands at the rate of 5% of classes NSR 2 and 3 lands annually. This amounts to a total of 408 ha of NSR 2 lands for the five-year term under review and 1,633 ha for the entire twenty-year period of the Agreement. The Company treated 3,146 ha of NSR 2 land for regeneration during the five-year period, thus exceeding their twenty-year commitment. Figure 3 shows the comparison of the NSR obligation and area treated. The committee was impressed by the Company's aggressive approach to the upgrading of NSR lands and commend the Company for their achievement in exceeding their NSR commitment.

FIGURE 2: COMPARISON OF ALLOWABLE DEPLETION AND HARVEST

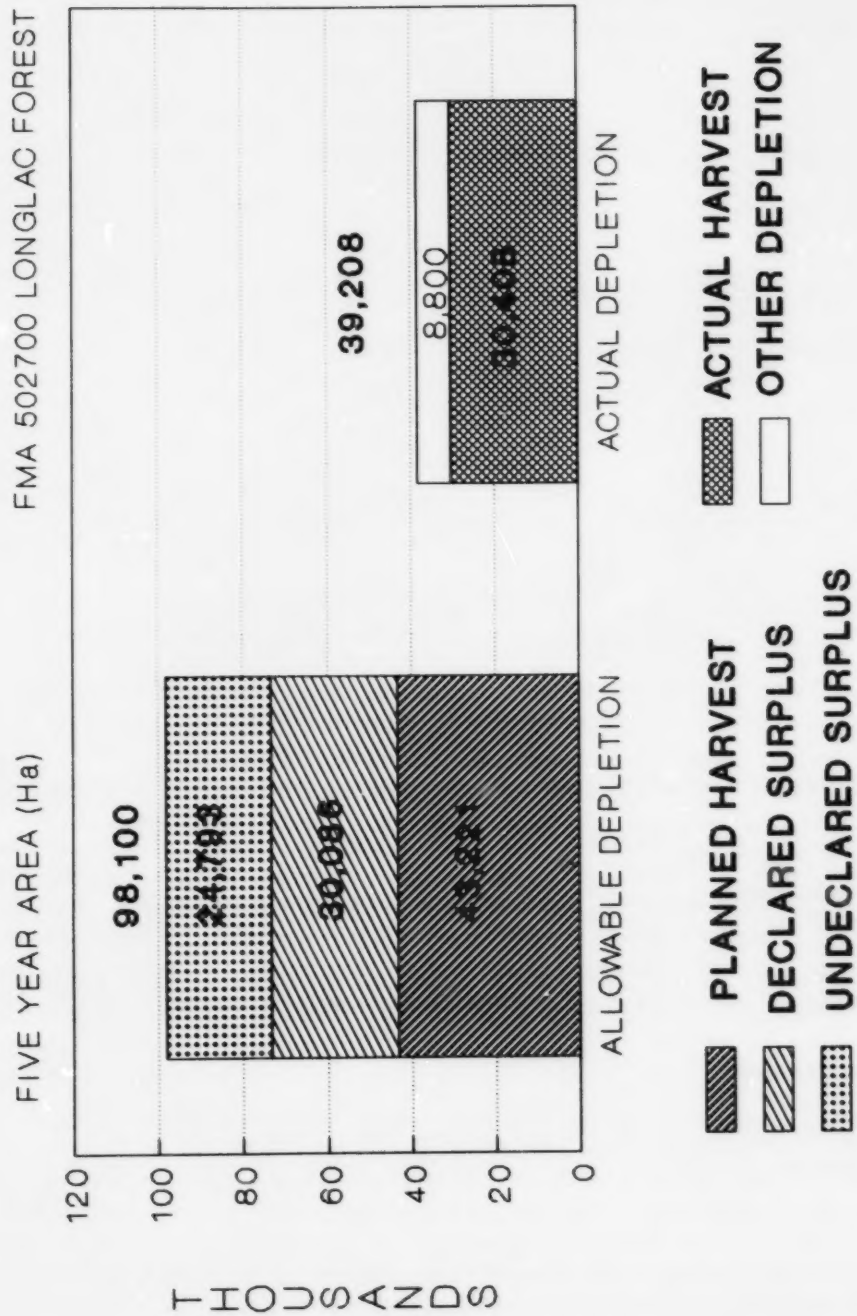


TABLE 4

Comparison of Forecast and Actual
Volumes in Cubic Metres (m³) of
Conifer and Poplar

FMA 502700
Longlac Forest
Kimberly - Clark Canada Inc.

Species	Forecast m ³	Actual m ³	% Actual vs. Forecast
Conifer	3,479,006	3,136,178	90
Poplar	1,154,972	1,050,144	91
Total	4,633,978	4,186,322	90

Data Source: Table 4.3.1 (1990-1995 TMP)

TABLE 5

Comparison of Actual and Forecast Yields
of Conifer and Poplar in Cubic Metres
per Hectare (m³/ha).

FMA 502700
Longlac Forest
Kimberly - Clark Canada Inc.

Species	1980-1985 Actual	1985-1990 Forecast	1985-1990 Actual	1985-1990 % Actual vs Forecast	1990-1995 Forecast
Conifer	113.5	83.9	103.1	122.9%	103.5
Poplar	20.5	26.8	33.6	125.4%	33.6

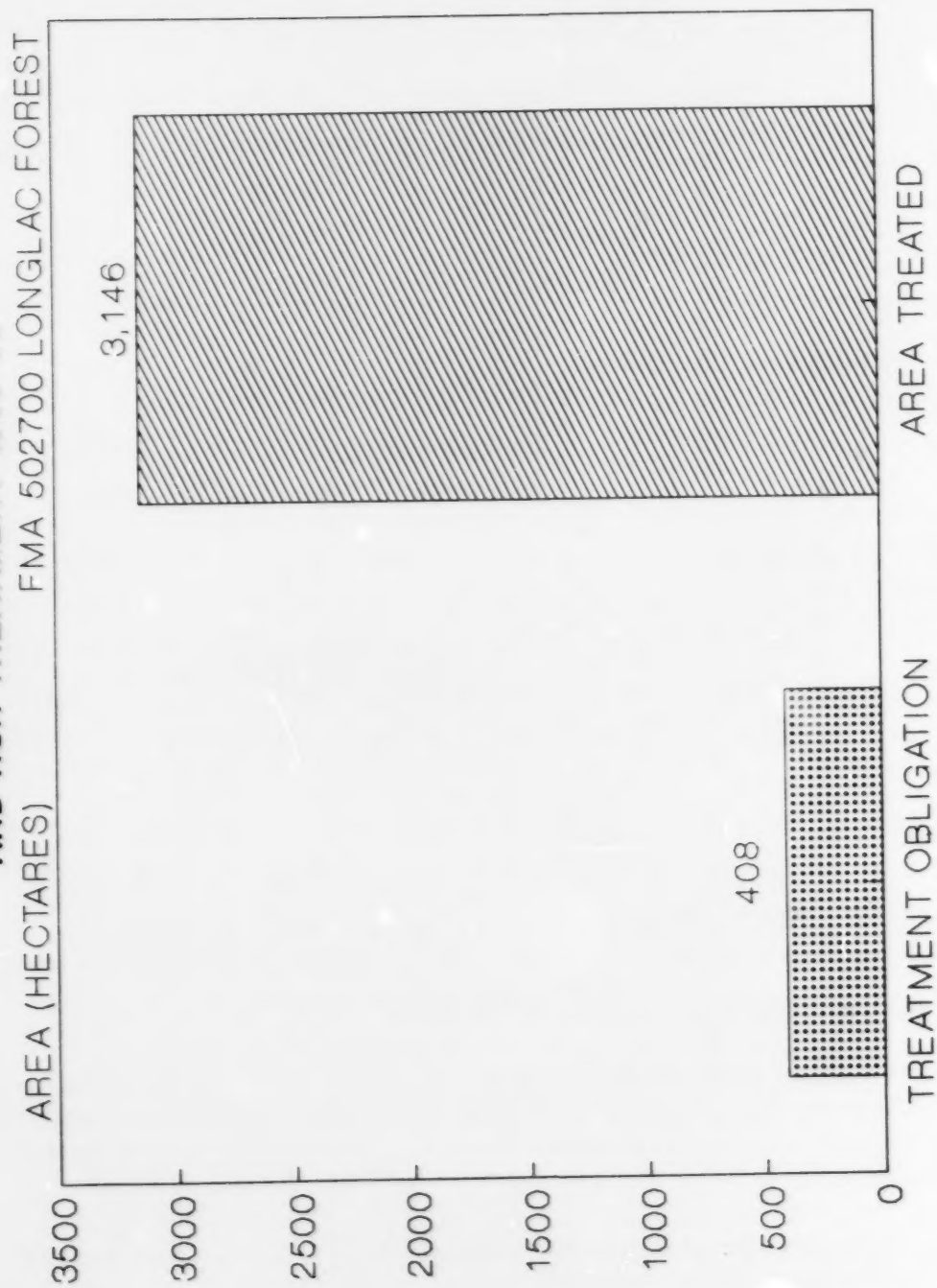
Data Source: 5 yr Summary Yield Data

2.5 ROAD CONSTRUCTION AND MAINTENANCE

Paragraph 31 of the Agreement provides for the Minister to reimburse the Company, subject to a maximum amount per kilometre, for the construction, reconstruction, and maintenance of roads on the Agreement area. To be eligible for payment, roads must be included in approved annual plans and constructed according to the standards specified in Schedule "E" of the Agreement.

The Longlac Forest is traversed by three main highways: No. 11 through the town of Longlac in the north-central area, No. 17 through Terrace Bay in the south, and No. 625 which runs south-east to Caramat. The Company has operated in the Longlac Forest for more than sixty years. Thus, a substantial road network existed before the FMA was signed in 1985. Table 1 shows that between

**FIGURE 3: COMPARISON OF NSR TREATMENT OBLIGATIONS
AND NSR TREATMENT 1985-90**



1985 and 1990, a total of 199 kilometres (km) of primary and secondary roads was constructed or reconstructed (6% reconstructed). This is considerably more than in the five years just prior to the FMA when about 137 km was added, and almost two times as much over the same period as in the Nakina Forest, the Company's other FMA to the north. These new roads enabled the Company and third parties to harvest old timber in the north-east and south-central portions of the forest. Despite the additions, concentrations of inaccessible, old stands remain in the extreme north-east.

On the Longlac Forest, funded roads were built by the Company (78%) or third parties (22%) in their respective areas of operation. Most (72%) of these roads were primary. Weldwood received funding for the construction of primary roads exclusively because their proposed secondary roads provided access to only patches of poplar suitable for veneer in areas too small and disjunct to qualify for funding.

Roads eligible for construction funding under the FMA were inspected jointly by representatives from the Company and the Ministry to verify standards and measure lengths. The Company invoiced the Ministry once inspected roads were approved. According to the Company, road funding does not cover the full cost of roads; the Company has traditionally built roads to very high standards in this area for year-round delivery of wood to their mills.

Table 1 shows that funding for the maintenance of FMA roads paid for a cumulative total of 418 km over the five years under review. The Company maintained another 801 km at their own expense. Roads eligible for maintenance dollars were graded, regravelled or repaired where necessary. Field inspections by the review team revealed that roads were well-maintained.

2.6 COMPANY RECORDS

The Company records for access roads, forest depletion and silvicultural projects were examined by the review team.

The preparation of depletion records begins each spring with the cut-over maps, where flight lines are plotted and supplementary aerial photographs are taken for each cut block. Cut-overs and depletions are marked on the photos, transferred to FRI forest type maps, and checked against AWSs and with camp foremen to classify depleted areas (reserves, unmerchantable, inoperable areas) that have been identified. Permanent depletion maps, colour-coded for the different categories, are prepared and areas are measured and entered into a computer file. This program will then prepare all tables, summaries, and stand listings to update the forest inventory and provide management information for the new planning cycle.

Silvicultural project data is recorded manually by Company technicians on silviculture cards and stand type maps (scale 1:15,840). This data is superimposed over the harvest area and colour-coded on the permanent compartment maps. All Company and Ministry silviculture records since 1985 have been entered into the Company's computerized silvicultural information system using Powerbase. This program is quite adequate for Company needs, will produce all the necessary reports and summaries and can be used to produce project invoices. The program is not compatible with the Ministry's silvicultural information system (SIS).

Road construction and silvicultural projects are approved for payment following the procedure specified in Section 10 of the ground rules. The accuracy of silvicultural reporting was checked by using a dot grid to determine the area of three relatively small site preparation projects. Two checked out 5% below the approved area and one was 2% below. The Ministry had approved the Company figure in each case.

Survival and stocking of plantations is determined through a series of assessment plots established in the first year and tallied in the first, third, and fifth years. Aerial seeding and natural regeneration is assessed in the third and fifth year. All stocking and survival data were collected manually during the review period (1985-1990) but will be included in a new Powerbase computer program in 1990.

The review committee was satisfied that Company records were well kept and met the requirements of the Agreement and the preparation of plans. The variety of data used and the massive amounts of information, maps and reports required in modern management planning have made record keeping a very important subject to FMA holders. An updated system amalgamating the data and mapping requirements into a Geographic Information System would improve and simplify FMA data management and plan preparation.

2.7 ANNUAL REPORTS

Paragraph 38 of the Agreement requires that the holder prepare an annual report in accordance with the approved manual, summarizing certain aspects of operations during the preceding year.

The annual report of Company operations on the Longlac Forest was submitted in two parts: a combined silviculture and road report in April and a separate depletion report in November, as specified in the Agreement and the TMP manual. These reports are the official records of what was done. Because the planning manuals require only tabular summaries of operations, no dated, written report was made outlining the highlights, problems, amendments, and other significant happenings of the year. It would greatly simplify the preparation of other plans (e.g., the section entitled Report of Past Operations in the next TMP) and the review process if such information was given annually. Records of submission dates were incomplete in the files of the Ministry and also those of the Company, but a review of both sets of records revealed that reports were on time or could not have been more than a few days late.

RECOMMENDATION: That annual reports be dated and contain a descriptive page of the year's highlights, including explanations for major differences between planned and actual achievements, amendments, and other significant events.

Further, the committee suggests that the Ministry formally inform the Company when each annual report has been approved, to ensure that both parties are aware of the status of annual reports. Except for a few minor clerical errors, annual reports of Company operations on the Longlac Forest appeared to be accurate. The committee sampled a few categories and years of silvicultural operations and road construction and found that all the invoiced work was reported and differed from totals shown in the five-year summaries by 1% or less. Earlier, the Company had found these errors when they were checking and adjusting their own data and Ministry data so they would be consistent with the new TMP reporting style. Corrections were reflected in the five-year summaries.

RECOMMENDATION: That the Company and District Crown Representative (DCR) of the Ministry thoroughly check and reconcile figures used in annual reports covering operations in the Longlac Forest before the reports are formally submitted to the Ministry, and that the DCR inform the Company in writing when each annual report has been approved by the District.

2.8 INTEGRATION WITH OTHER FOREST USERS

Section 14 of the ground rules, entitled Modified Management Areas (MMAs; now called Areas of Concern or AOCs) explains how the Ministry, in consultation with the Company, will manage certain lands to meet objectives other than or in addition to the production of wood fibre.

As specified in the ground rules, AOCs in or near areas scheduled to be cut during 1985-1990 were identified on maps and accompanying summary sheets in the operating plan. The Ministry included details of all AOCs with the Company's Cutting Approvals. By initiating amendments to the operating plan, the Ministry was able to use information obtained from wildlife surveys conducted after the plan was approved to create a large number of additional AOCs in the Company's area of operations.

The Agreement recognized two types of AOCs: linear AOCs along roads and waterways, and non-linear AOCs encompassing mainly wildlife habitat. The Timber Management Guidelines for the Protection of Tourism Values, the Timber Management Guidelines for the Protection of Fish Habitat, and the Timber Management Guidelines for the Provision of Moose Habitat all permit selection harvesting in AOCs in some cases, and cuts in strips or blocks of various configurations in other cases. However, during the period under review, all AOCs were reserves where no cutting occurred. The Company proposed a modified cut design in a reserve along the highway No. 11 corridor. Such a design could maintain the aesthetic quality of a site while maximizing the amount of wood harvested, which is consistent with the original intent of the Ministry's MMA program. Unfortunately, the design proved to be too difficult to lay out, and more subject to blowdown than regular reserves. The review team was disappointed that the Ministry and the Company could not use more ingenuity in varying the layout of reserves to provide vistas, some open shoreline, and to maximize timber harvest in proximity to small, warm-water lakes.

Prescribed widths of the reserves outlined by the Ministry ranged from 60 to 200 m, but most were 120 m. According to the Company, in most cases the Company elected in the field to make actual reserve widths somewhat greater than prescribed to simplify and reduce the cost of lay out (e.g., along a sinuous shoreline), and to preclude the accidental penetration of reserves which could result in trespass charges being levied by the Ministry. The generally larger reserves and the Company's policy of giving each operator a coloured air photo illustrating the area of operations likely explain why the Company has avoided such charges. Third parties have similarly respected reserves; only one charge was sustained by Weldwood and this resulted from an accidental mapping error. The committee commends the Company and the third parties for respecting reserve boundaries.

No nests of eagles, ospreys, or herons were in the vicinity of Company operations during 1985-1990. The committee noted that there are nineteen such nesting areas shown on the values maps in the new TMP. A total of 529 AOCs was identified in the new TMP. These AOCs encompassed osprey and heron nests, canoe routes, special features of the habitats of moose, caribou, deer and fish, cottages and tourism lakes, access points, ski trails, archaeological sites, experimental plots, and areas planned for silvicultural treatment as prescribed burns. The Company appears to have a

positive attitude toward wildlife concerns for they have participated in wildlife surveys and have attended a seminar on application of the moose guidelines.

The Company has an excellent relationship with other forest users and the general public and is commended for their initiative and co-operation with the Ministry in this respect. Although not required to do so, they contacted in person individuals who might have concerns regarding specific timber operations proposed for the Longlac Forest. These personal contacts served in part to avert conflicts which might have arisen between the Company and other forest users following implementation of Terrace Bay District's District Land Use Guidelines. The Company maintains a very open attitude toward their work in the Longlac Forest. Each year, the Company and the District office of the Ministry run a conservation school for young people which includes a tree planting project and tours illustrating all aspects of forestry operations in the Longlac Forest. The Company has hosted similar tours for the general public and forestry students.

On the Longlac Forest, roads generally follow the existing north-east to south-west drainage, minimizing the number of major crossings needed. In 1985-1990, specifications for water crossings were left up to the Company. Field inspections by the committee revealed that crossings were generally adequate. The Company is endeavouring to ensure that future crossings are environmentally acceptable as evidenced by their initiation of a two-day seminar for field staff on application of the new guidelines for water crossings.

Clearcut size is an important wildlife consideration. Field inspections showed that cut size has been decreasing progressively since 1985. Although it was not the specific intent of the Company, the effective size of most cuts made between 1985 and 1990 was reduced by natural topographic variation and patches of inoperable or unmerchantable timber. AOCs for wildlife corridors, and lake and stream reserves reduced the size of other cuts. The review team observed a further reduction in the effective size of new cut-overs where the current guidelines (see above) are being rigidly applied.

3. MAINTENANCE OF PRODUCTIVITY

Table 2 shows that the maximum allowable depletion (MAD), which was calculated at the beginning of the five-year 1985-1990 term, for the Longlac Forest to be 98,100 ha for all working groups combined. The calculations were based on the OWOSFOP method of determining MAD, which gives an accelerated harvest early in the planning period and a reduced volume later in the rotation.

The Ministry and the Company were especially concerned with the long term over-harvesting and current accelerated allocation of upland spruce. This has caused a harvesting imbalance between spruce upland and lowland sites, threatening the year round delivery of wood and the consistent flow of by-product material. To stabilize the economic wood supply to the mills through sustained yield management, the Ministry requested the Company to use the FORMAN model to calculate the 1990-1995 MAD. This model utilizes growth and yield data, in addition to factors used in the OWOSFOP model, to develop a sustained yield wood supply plan. The original spruce working group has now been divided into three forest units for the 1990-1995 MAD and in the development of the new inventory being prepared for the 1995-2015 TMP.

The three forest units are as follows:

1) spruce upland	FRI - SX,1,2	Rotation age 90 years
2) spruce lowland	FRI - SX,1,2	Rotation age 100 years
3) spruce lowland	FRI - S3	Rotation age 110 years

Implementation of the FORMAN model and reclassification of the spruce working group into three forest units has resulted in a 1990-1995 MAD of 42,956 ha versus a 1985-1990 MAD of 98,100 ha. The allocation of the spruce working group was reduced by 44%. On the basis of the facts presented, the Committee agrees with the use of the FORMAN model but feels that such a dramatic change in the harvest cut calculation over such a short period of time not only alters the flow of fibre but questions the credibility of all forest regulation calculations in a period of close public scrutiny.

The committee commends the Company and the Ministry for their initiative in developing this classification of the spruce working group and recommends its consideration in other FMAs with a similar imbalance of harvesting on upland and lowland spruce sites.

From 1950 to 1988 the Company operated a forest nursery. Planting stock from the nursery was used in an annual renewal program of their harvest area. To further long-term productivity, seed orchards were established in 1951 for black spruce and white spruce, and seed from these orchards was used to grow most of the planting stock. The Company planted in excess of 35 million trees prior to the signing of the FMA and the Ministry and Company planted the 100 millionth tree on the limits in 1989. The committee commends both parties for this achievement. In 1988 the Company closed the forest nursery as a result of excess growing capacity at the MNRs nursery in Thunder Bay and the inability of the Ministry and the Company to agree on a mutually acceptable price paid for the planting stock. The Ministry is currently tending the seed orchard.

The committee believes the Company to be fully committed to the FMA but notes that 1990 is the first year the Company has assumed the full responsibility for the full work load following the phase-in period. This increase of field work in addition to inventory, management and planning responsibilities has placed a heavy work load on the forestry staff which has remained constant since the early 1980s. The increasing problems of a heavy spruce budworm infestation and tree mortality through large areas of the FMA as well as the poor poplar growth on many mixed wood stands being allowed to regenerate naturally to poplar will continue to add to the forestry workload. The Company may wish to review their professional staff workload to ensure the successful management of the Longlac Forest.

4. COMPANY CONCERNS

The Company was provided an opportunity to express any concerns regarding FMA 502700, the Longlac Forest, or the Ministry's administration of the Agreement. The following are the concerns as expressed by Kimberly-Clark Canada Inc.:

- i) the liquidated damages clause in the FMA. This clause was intended to prevent companies from avoiding surplus declarations. In the case of the Kimberly-Clark licence,

the surplus as identified in the first five year period has been proven not to exist. The Company believes there are too many unpredictable, unavoidable variables to enable a prediction within 10% accuracy of the allocation of large areas and volumes of timber over a five-year period.

- ii) the reduction of the level of FMA funding for roads.
- iii) the interpretation of various Ministry guidelines by Ministry staff as being rules and not guidelines.
- iv) the cap on nursery stock production.
- v) the administrative requirements of planning and managing two FMAs.
- vi) the provincial planting rates do not adequately reflect the cost of planting bare-root and container stock.
- vii) the Company wishes to have cold storage facilities for 3 to 4 million trees located in the Geraldton District.

5. CONCLUSIONS AND RECOMMENDATIONS

The review committee was satisfied that the obligations of the Company under the Agreement have been satisfactorily performed during the five-year term under review. They were particularly impressed by the co-operation between the Company and Ministry staff, as demonstrated by their solution to management problems in the spruce working group through establishment of three forest units to better reflect management requirements. The Company has also clearly demonstrated its ability to modify harvesting methods and silvicultural prescriptions to successfully regenerate lowland spruce sites. The committee is concerned however with the quality of natural regeneration in the poplar working group, aerial herbicide requirements to protect conifer regeneration, and site preparation on difficult sites. The Company may also wish to review its professional staff available for the increasing workload on this FMA.

The committee was concerned by the dramatic change in the MAD calculation between the 1985-1990 and 1990-1995 plan periods and the effect this could have on public preceptions of forestry calculations. The committee commends the Company for a very successful artificial regeneration program and a demonstrated ability to address the needs of other user groups in the Longlac Forest.

The following are the committee's recommendations:

RECOMMENDATION NO. 1: That the Minister extend the remaining period of FMA 502700 for a further term of five consecutive years to March 31, 2010.

RECOMMENDATION NO. 2: That the Company review its tending program for all sites regenerated to coniferous working groups to ensure that plantations reach Free-to-Grow status.

RECOMMENDATION NO. 3: That the Company provide the opportunity for key staff to improve their knowledge of forest sites using the Forest Ecosystem Classification and training arranged through the Technology Development Unit in Thunder Bay.

RECOMMENDATION NO. 4: That 1) the Company review the status of lands cut-over during the five-year term for which Table 1 of the ground rules specifies treatment but which have received no treatment, and 2) the Company propose areas to be classified non-treatable to the Ministry and report any areas mutually agreed to be non-treatable in annual reports prior to the preparation of the 1995-2015 TMP.

RECOMMENDATION NO. 5: That in the event the Company should forecast harvest levels during the second five-year term to fall below the 90% harvest level stated in the current plan, the Company should request, with reasonable explanation, an undercut variation from the Minister and amend its management plan with a further surplus declaration.

RECOMMENDATION NO. 6: That annual reports be dated and contain a descriptive page of the year's highlights, including explanations for major differences between planned and actual achievements, amendments, and other significant events.

RECOMMENDATION NO. 7: That the Company and District Crown Representative (DCR) of the Ministry thoroughly check and reconcile figures used in annual reports covering operations in the Longlac Forest before the reports are formally submitted to the Ministry, and that the DCR inform the Company in writing when each annual report has been approved by the District.

APPENDIX "A"

TERMS OF REFERENCE FOR THE SECOND FIVE-YEAR REVIEW OF A FOREST MANAGEMENT AGREEMENT

1. To undertake a fair and objective review of the performance of the Agreement holder vis-a-vis the obligations under the Agreement, namely:
 - the preparation of a timber management plan and the preparation of annual plans or annual work schedules according to the time frames specified in the Agreement and according to the manuals that have or had been approved by the Minister for this purpose,
 - the management of the forests on the Agreement area and the conducting of operations in accordance with the approved plans or amendments to those plans,
 - the performance and observance of the provisions of the ground rules set out in Schedule "C" of the Forest Management Agreement including those for silvicultural operations and invoicing,
 - the maintenance of cutting operations at a level between 90% and 110% of the maximum allowable depletion (MAD) excepting that area which has been declared surplus or reserve in the approved or amended timber management plan,
 - the reforestation of NSR lands at the rate specified in the Agreement,
 - the construction of roads in accordance with the approved plans or amendments and to the standards specified in the Agreement,
 - the preparation and submission of accurate annual reports, according to the Agreement and as specified in the manual that has or had been approved by the Minister for this purpose,
 - the extent to which the goal statement has been met and any significant impact on wood supply where there has been a variance from the objective.
2. To examine the depletion records, silvicultural records, maps of cut-over areas classed non-treatable and the road construction maps of the Agreement holder with regard to their adequacy and their conformity with the records or record summaries of the Ministry's designated Crown representative.
3. To examine the relationships between the predicted volume/area yields in the timber management plan with,
 - (a) actual yields reported for the past five-year period
 - (b) yields forecasted for the next five-year period.

4. To examine and report on the relationship between planned and actual wood harvested for the five-year period.
5. To select and field inspect silvicultural projects representative of the techniques employed and sites found on the forest for conformity with both the Agreement holder's records, and the standards as outlined in Table 1 of Schedule "C" of the Forest Management Agreement.
6. To examine and report on the effectiveness of the MNR supported road construction and maintenance program and disposition of available funding by evaluating the following aspects of the program:
 - (a) Maturity of the FMA, existing access at the time of period renewal and post renewal road status.
 - (b) Effectiveness in accessing targeted and approved harvest and maintenance allocations.
 - (c) Third party implications.
7. To determine by field inspection the degree to which other forest users and other forest values have been accommodated in management planning and operations.
8. To meet with management staff of the Company and to identify with them problem areas or concerns on the part of the Agreement holder with respect to the Agreement, its administration and the working relationship with the Ministry staff.
9. To meet with district Ministry staff, and to identify with them the problem areas or concerns on the part of the Ministry with respect to the Agreement, its administration and the working relationship with the Company staff.
10. To examine and report upon the relationship between the harvest and growth, by applying Free-to-Grow benchmark standards, including forest regeneration success, that has occurred on the forest during the ten-year period.
11. To make recommendations on the extension of the Agreement's term according to the "Evergreen" section of the Agreement, and to make such other recommendations that are judged to be relevant to the performance or obligation of the Agreement holder on the Agreement area.
12. To review the recommendations of the first five-year review and report on the status of implementation.
13. To examine and report if fifth-year stocking assessments have been carried out and if the areas described in Table 1 of the ground rules assessed as failures have been retreated at Company cost.

14. To examine and report if Free-to-Grow (FTG) assessments have been carried out and if the area approved as FTG is placed back into the forest resource inventory as productive forest land in the 1-20 year age class.
15. To examine and report on company forest management activities conducted beyond the obligations under the Agreement by evaluating:
 - (a) Areas that have been treated for renewal at the company's expense.
 - (b) Areas that have been treated for maintenance at the company's expense.
16. To examine and report on examples of innovative forestry practices and beneficial forest stewardship.
17. To examine and report where the Company has taken a positive approach beyond the planning process to address public concerns.
18. To examine and report on Company participation in the field of research and tree improvement.
19. To examine and report if the wood supply strategies are sufficient to meet long term (20 years) projected harvest levels.

APPENDIX "B"

TERMS OF REFERENCE FOR THE FIRST FIVE-YEAR REVIEW OF A FOREST MANAGEMENT AGREEMENT

1. To undertake a fair and objective review of the performance of the Agreement holder vis-a-vis the obligations under the Agreement, namely:
 - the preparation of management plans and an operating plan, and the preparations of annual plans or annual work schedules according to the time frames specified in the Agreement and according to the manuals that have or had been approved by the Minister for this purpose,
 - the management of the forests on the Agreement area and the conducting of operations in accordance with the approved plans or amendments to those plans,
 - the performance and observance of the provisions of the ground rules set out in Schedule "C", including those for silvicultural operations and invoicing,
 - the maintenance of cutting operations at a level between 90% and 110% of the allowable cut, excepting that area which has been declared surplus or reserved in the approved management or operating plan or amendments,
 - the reforestation of NSR lands at the rate specified in the Agreement,
 - the construction of roads in accordance with the approved plans or amendments and to the standards specified in the Agreement,
 - the preparation and submission of accurate annual reports, according to the Agreement and as specified in the manual that has or had been approved by the Minister for this purpose.
2. To examine the depletion records, silvicultural records, maps of cut-over areas classed non-treatable and the road construction maps of the Agreement holder with regard to their adequacy and their conformity with the records or record summaries of the Ministry's designated Crown representative.
3. To examine the relationships between the predicted volume/area yields in the management and operating plans with
 - (a) pre-FMA historical yields
 - (b) actual yields reported for the five year period and
 - (c) yields forecasted for the next five year period.

4. To examine and report on the relationship between predicted, directed, and actual wood flow for the five-year period.
5. To select and field inspect silvicultural projects representative of the techniques employed and sites found on the forest for conformity and both the Agreement holder's records, and the standards as outlined in Table 1 of Schedule "C" of the Ground Rules in the Forest Management Agreement.
6. To examine and report on the effectiveness of the MNR supported road construction and maintenance program and disposition of available funding by evaluating the following aspects of the program:
 - (a) Maturity of the FMA, existing access at the time of signing and post FMA road status.
 - (b) Effectiveness in accessing targeted and approved harvest and maintenance allocations.
 - (c) Third party implications.
7. To determine the degree to which other forest users and other forest values have been accommodated in management planning and operations by including a field inspection.
8. To meet with management staff of the Company and to identify with them problem areas or concerns on the part of the Agreement holder with respect to the Agreement, its administration and the working relationship with Ministry staff.
9. To meet with district staff of the Ministry, including the designated Crown representative, and to identify with them problem areas or concerns on the part of the Ministry with respect to the Agreement, its administration and the working relationship with the Company staff.
10. To examine and report upon the relationship between the harvest and growth, including forest regeneration, that has occurred on the forest during the period under review.
11. To make recommendations on the extension of the Agreement's term according to the "Evergreen" section of the Agreement, and to make such other recommendations that are judged to be relevant to the performance or obligations of the Agreement holder on the Agreement area.